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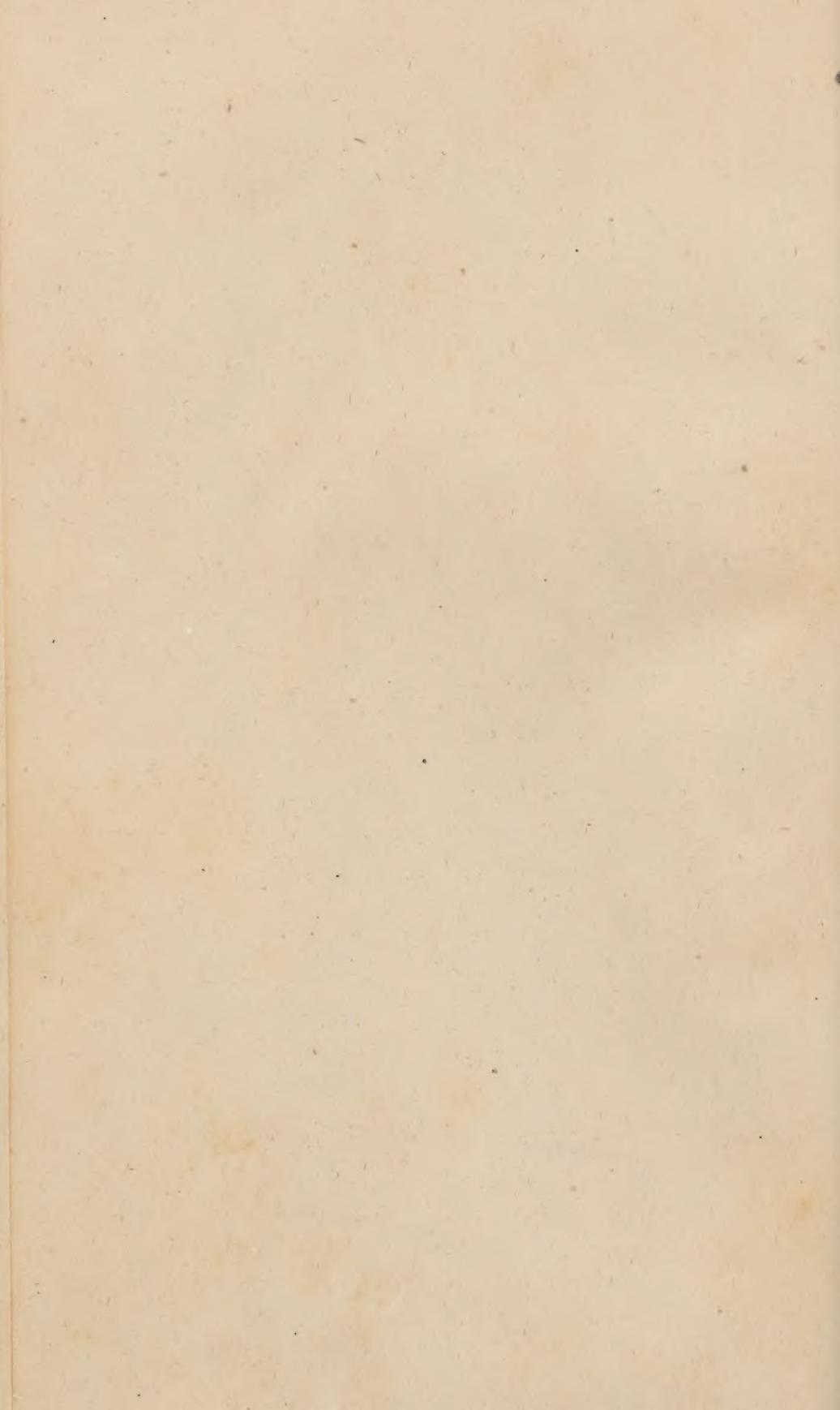
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pedunculate and few-flowered. Sepals very short, rounded, glabrous. Petals narrow, induplicate-valvate, with inflexed tips, 2 to $2\frac{1}{2}$ lines long, glabrous. Filaments rather thick, dilated and ciliate towards the base, subulate and inflexed at the top. Ovary hirsute round the base of the style, otherwise glabrous; style rather long, the stigma not thickened, obscurely 4-lobed. Fruit succulent, with a crustaceous 4-celled endocarp, obtusely 4-angled, truncate at the top, and depressed in the centre, $\frac{1}{2}$ in. diameter or rather smaller.—*Lawsonia Acronychia*, Linn. f.; *Labill. Sert. Austr. Caled.* 66, t. 65; *Cyninosa oblongifolium*, A. Cunn. in *Bot. Mag.* 3222; *Acronychia laurina*, F. Muell. *Fragmenta* i. 27.

Queensland. Keppel Bay, R. Brown; Moreton Bay and Brisbane river, A. Cunningham, F. Mueller, and others; Rockhampton, Thozet.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, A. Cunningham, and others; northward to Clarence and Hastings rivers, Beccal; southward to Yowaka river and Lake King, F. Mueller.

According to F. Mueller, the leaves are occasionally 3-foliate, but I have never seen them so.

3. **A. imperforata**, F. Muell. *Fragmenta* i. 26. A moderate-sized tree, very nearly allied to *A. laevis*. Leaves of the same shape and size, but on much shorter petioles, and much more coriaceous, the minute pellucid dots only visible before a strong light. Inflorescence and flowers as in *A. laevis*, except that the peduncles are much shorter and the flowers rather larger. Filaments much ciliate. Fruit somewhat obovoid and obscurely or not at all angular, and not depressed at the top.

Queensland. N.E. coast, R. Brown; Brisbane river, W. Hill, F. Mueller.

TRIBE IV. AURANTIEÆ. —Trees or shrubs. Leaves pinnate with alternate leaflets or 1-foliate or simple. Stamens twice as many as petals or more. Ovary not lobed. Fruit indehiscent. Seeds without albumen.

24. GLYCOSMIS, Corr.

Calyx 5-cleft, the lobes broadly imbricate. Petals 5, imbricate in the bud. Stamens 10, filaments dilated at the base, anthers often tipped with a small gland. Ovary 3- to 5- or rarely 2-celled; style very short, thick and persistent, the stigma scarcely broader, ovules solitary in each cell. Berry succulent or almost dry, usually 1-seeded. Seeds with a membranous testa, without albumen; cotyledons fleshy.—Unarmed trees or shrubs. Leaves alternate, pinnate, with few alternate leaflets, or 1-foliate. Flowers small, in axillary or terminal panicles.

A genus of very few species, dispersed over tropical Asia and the Eastern Archipelago, the Australian one being the most widely spread over the whole region.

1. **G. pentaphylla**, Corr.; *Olio. in Journ. Linn. Soc. v. Suppl.* 37. A tall shrub or small tree, quite glabrous. Leaves occasionally 1-foliate, on short petioles, but more generally pinnate, with 2 or 3 leaflets, from ovate-elliptical or ovate-lanceolate to oblong-lanceolate, obtuse or acuminate, 2 to 4 or rarely 5 in. long. Panicles dense, shorter, or scarcely longer than the petiole of the pinnate leaves. Petals about 2 lines long. Ovary 5- or some-

times 4-celled, contracted into a very short, thick style. Berry globular, $\frac{1}{2}$ in. in diameter, or smaller.

Queensland. Northumberland islands, *R. Brown*; islands of Torres Straits, *F. Mueller*; scrub near Rockhampton, *Thozet*.

The species has a very wide range in tropical Asia and is very variable in the size of the leaves and flowers, full details of which and of the consequently extended synonymy of the species will be found in Oliver's paper above quoted. The character given above has special reference to the Australian variety, which is almost identical with the Chinese and Eastern form, usually distinguished as *G. citrifolia*, Lindl.; Benth. in Fl. Hongk. 51, and figured as *Limonia parvifolia*, Hook. Bot. Mag. t. 2416.

25. MICROMELUM, Blume.

Calyx 5-toothed or entire. Petals 5, valvate in the bud, or nearly so. Stamens 10; filaments linear-subulate. Ovary 2- to 6- usually 5-celled, the dissepiments spirally twisted after the flowering; style deciduous with a small capitate stigma; ovules 2 in each cell, superposed. Fruit a dry berry. Seeds usually 1 or 2; testa membranous; albumen none; cotyledons leafy, very much folded.—Unarmed trees. Leaves alternate, pinnate, with alternate oblique leaflets. Flowers small, in terminal corymbose panicles.

Besides the Australian species, which is widely dispersed over tropical Asia and the Eastern Archipelago, only 2 are known from Penang or the Philippine Islands.

I. M. pubescens, Blume; *Oliv. in Journ. Linn. Soc. v. Suppl. 40*. Young branches and leaves more or less pubescent. Leaflets 9 to 15, or sometimes more, from ovate to broadly lanceolate, 1 to 3 in. long, obtuse or shortly acuminate, oblique at the base, often becoming glabrous above, pubescent underneath. Corymbs nearly sessile above the last leaves, many-flowered. Calyx more or less 5-toothed. Petals about 2 lines long, more or less pubescent. Ovary usually hairy. Berry small, ovoid, glabrous or pubescent.

N. Australia. S. Goulburn Island and Port Essington, *A. Cunningham*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Albany and Cairnross Islands and from the Burdekin to Moreton Bay, *F. Mueller*; Cape Upstart and Barnard Isles, *McGillivray*; Wide Bay, *Bidieill*; Rockhampton, *Thozet*.

The various forms assumed by this species and the consequent synonymy are given in detail by Oliver in the above-quoted paper. The Australian specimens belong to the small-flowered variety, with rather broad leaflets, common in the S. Pacific islands, which I formerly described as *M. glabrescens*, in Hook. Lond. Journ. ii. 212.

26. MURRAYA, Linn.

Calyx 5-cleft. Petals 5, narrow, imbricate in the bud. Stamens 10, free; filaments subulate; anthers small. Ovary 2- to 5-celled. Style elongated, at length deciduous, stigma capitate. Ovules solitary, or 2 in each cell, superposed, or nearly collateral. Berry 1- or 2-seeded. Testa glabrous or woolly; albumen none; cotyledons equal, not folded.—Unarmed trees or shrubs. Leaves pinnate, leaflets alternate, usually oblique at the base. Flowers often rather large, in terminal corymbs, or few together in the upper axils.

The genus comprises few species, dispersed over tropical Asia and the Eastern Archipelago; neither of the Australian ones are endemic.

Ovary 2-celled. Flowers nearly $\frac{1}{2}$ in. long 1. *M. exotica*.
 Ovary 5-celled. Flowers numerous, not 3 lines long 2. *M. crenulata*.

1. ***M. exotica*, Linn.**; *Oliv. in Journ. Linn. Soc. v. Suppl.* 28. A shrub or small tree, glabrous, or the young branches and petioles pubescent. Leaflets usually 5 to 7, from ovate, cuneate-obovate, or almost rhomboidal to ovate-lanceolate, $\frac{1}{2}$ to 2 in. long, coriaceous and shining when full-grown. Flowers white, very fragrant, in compact, terminal, sessile corymbs, or few together in the common varieties. Petals nearly $\frac{1}{2}$ in. long, erect at the base, spreading in the upper half. Ovary 2-celled. Berry globular or almost ovoid, usually 2-seeded.—Wight, Ic. t. 96.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Scrub near Rockhampton, *Theozet*. These specimens are past flower and have only a few young fruits, which are more ovoid than they generally are in the species, but in other respects they appear to belong as well as Brown's to the few-flowered var. β of Oliver, or *M. paniculata*, Jack. The species is common from N.W. India to the New Hebrides.

2. ***M. crenulata*, Oliv. in Journ. Linn. Soc. v. Suppl.** 29? A glabrous shrub or tree. Leaflets usually 7 to 11, very oblique, from oval-oblong to oblong-elliptical, obtuse or shortly acuminate, 2 to 3 in. long, entire or obscurely crenulate. Flowers (in the Philippine specimens) in terminal corymbs, much more numerous and much smaller than those of *M. exotica*. Petals $2\frac{1}{2}$ to nearly 3 lines long. Fruit depressed-globular, 5 or 6 lines diameter, 5-celled, but with 3 or 4 cells abortive. Seeds 1 or 2; cotyledons plano-convex, thick and fleshy.—*Glycosmis crenulata*, Turez. in Bull. Mose. 1858, i. 250.

Queensland. Eastern subtropical Australia, *Herb. Mueller*. The specimens are in fruit only, but the foliage, the inflorescence, and calyx are so precisely those of the Philippine Island ones that there is little doubt that they belong to the same species. The structure of the fruit is quite that of *Murraya*; the cotyledons of the seed very readily distinguish it from *Micromelum*, which in many respects has a similar habit and inflorescence.

27. CLAUSENA, Burm.

Calyx 4- or 5-cleft. Petals 4 or 5, broad, imbricate in the bud. Stamens 8 or 10; filaments dilated at the base or in the middle; anthers short. Ovary 4- or 5-celled, or rarely 2- or 3-celled; style deciduous, with an entire or lobed stigma; ovules 2 in each cell, collateral or superposed. Berry ovoid oblong or globular. Seeds with a membranous testa; no albumen; cotyledons plano-convex.—Unarmed trees or shrubs. Leaves pinnate, with alternate, usually oblique leaflets. Flowers small, usually clustered in terminal or axillary panicles or racemes. Berries small.

The genus, although not large, comprises more species than any other one of the tribe *Aurantieae*, and extends over tropical Asia and Africa; the only Australian species known is endemic.

1. ***C. brevistyla*, Oliv. in Journ. Linn. Soc. v. Suppl.** 31. Apparently a shrub, glabrous, or the young branches and petioles slightly pubescent. Leaflets 10 to 15, very obliquely ovate or somewhat rhomboidal, shortly and obtusely acuminate and emarginate, mostly 2 to 4 in. long, membranous, often obscurely sinuate-dentate, on petiolules of about 2 lines. Flowers

4-merous or 5-merous, in terminal, loose, oblong or pyramidal panicles. Petals about 2 lines long. Filaments thick and dilated at the base, arched. Ovary glabrous or nearly so, narrowed at the base, 4- or 5-celled. Style very short. Fruit not seen.

Queensland. Hope Islands, *McGillivray*. The species is allied to *C. leptocephala*, W. and Arn., from E. India, but the leaflets are much more oblique, the style much shorter, besides minor differences.

28. ATALANTIA, Corr.

Calyx 3- to 5-cleft. Petals 3 to 5, imbricate in the bud. Stamens twice as many or rarely more, free or irregularly united at the base; anthers ovate or oblong. Ovary 2- to 5-celled; style deciduous, with a capitate stigma; ovules solitary or 2 in each cell, collateral or rarely superposed. Berry globular, with a thickened rind, 1- to 5-seeded. Seeds obovoid or oblong, testa membranous; albumen none; cotyledons flat or convex, more or less fleshy. Shrubs or small trees, unarmed or thorny. Leaves simple, coriaceous. Flowers in axillary clusters or short racemes or small cymose panicles, occasionally solitary. Fruits usually larger than in the preceding genera.

The genus is dispersed over tropical Asia. The Australian species are both endemic; one however is in some measure doubtful, the flowers being unknown, and the other is slightly anomalous in character though congener in essential points, and habit. The genus, in the increased number of stamens of two species, and in the inflorescence, fruit, and seeds, connects the anomalous *Citrus* with the rest of the tribe.

Leaves narrow. Spines straight or incurved. Pedicels clustered in the axis of the leaves 1. *A. glauca*.
 Leaves ovate. Spines mostly recurved. Racemes short, axillary or terminal 2. *A. recurva*.

1. *A. glauca*, *Hook. f.*, in *Benth. and Hook. Gen. Pl.* 305. A rigid glaucous shrub of 2 or 3 ft., often armed with straight or incurved axillary spines of $\frac{1}{2}$ in. or under, the young shoots whitish with a very minute pubescence. Leaves oblong-linear or slightly cuneate, very obtuse or emarginate, mostly 1 to $1\frac{1}{2}$ in. long, thick, rigid, veinless, narrowed into a short petiole; those on the barren shoots sometimes marked with a few coarse crenulations. Flowers usually 2 or 3 together in the axils, on pedicels of 1 to 2 lines. Sepals 3 or 4, short and broad. Petals 3 or more frequently 4, obovate or broadly oblong, 2 to $2\frac{1}{2}$ lines long, thin, concave, much imbricate. Stamens 8 to 12, or sometimes more, the filaments often slightly united at the base. Disk thick, annular. Ovary 4- or 5-celled, with 1, or occasionally 2, superposed ovules in each cell. Style rather thick. Berry globular, about $\frac{1}{2}$ in. diameter. Seeds 3 or 4, obovoid, slightly compressed; cotyledons slightly fleshy, but not thick.—*Triphasia glauca*, Lindl. in *Mitch. Trop. Austr.* 353; Oliv. in *Journ. Linn. Soc. v. Suppl.* 26.

Queensland. Broad Sound, *R. Brown*; Maranoa river, *Mitchell*; Suttor and Burdekin rivers, *F. Mueller*; Port Denison, *Fitzalan*. The species, although anomalous in some respects, has the foliage and inflorescence of *Atalantia*, and is allied in several respects to *A. Hindsii*, Oliv., approaching like that species to *Citrus* in the increased number of stamens.

2. *A. (?) recurva*, *Benth.* Glabrous, armed with axillary spines, very spreading or recurved. Leaves broadly ovate, obovate or elliptical, mostly





very obtuse, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, coriaceous, on petioles of 1 to 3 lines. Racemes axillary, sometimes 2 together, $\frac{1}{2}$ to 1 in. long, or terminal and slightly branched. Pedicels very short. Calyx minute, 3- or rarely 4-lobed. Petals and stamens not seen. Berries globular, either 1-seeded and 3 or 4 lines diameter, or 2-seeded and larger.

N. Australia. Carcass Bay, N.W. coast, A. Cunningham; island of the Gulf of Carpentaria, R. Brown (Hb. R. Br.). The flowers are wanting, to determine definitely the affinities of this species. R. Brown's specimens are however in very good fruit. A. Cunningham's are in leaf only, with some remains of the inflorescence and calyx.

29. CITRUS, Linn.

Calyx 3- to 5-lobed. Petals 4 to 8, thick, imbricate in the bud. Stamens indefinite, usually numerous, filaments flattened at the base and variously connate, anthers oblong. Disk large, cupular or annular. Ovary of 6 or more cells; style deciduous, with a capitate lobed stigma; ovules 4 to 8 in each cell, in 2 rows. Berry globular or oblong, with a thickened rind, several-celled, with thin dissepiments, the cells more or less filled with transverse pulpy cellules. Seeds with a coriaceous testa; albumen none; embryos often more than one; cotyledons fleshy, plano-convex. Trees or shrubs, often armed with axillary spines. Leaves 1-foliate, the petiole often winged. Flowers white, axillary, solitary clustered or shortly paniculate.

The really wild species are few, chiefly from tropical Asia, but long culture in most hot countries has produced numerous permanent varieties. The Australian ones differ from the others in the short petiole not at all winged.

Fruit globular. (Stamens about 10?) 1. *C. australis*.
Fruit oblong. Stamens above 20 2. *C. australasica*.

1. ***C. australis***, *Planch. in Hort. Donat.* 18 (partly). A tree of 30 ft. or more, quite glabrous, with axillary straight thorns of about $\frac{1}{2}$ in. Leaves ovate, obovate, or almost rhomboidal, 1 to 2 in. long, obtuse or emarginate, the petiole not exceeding 3 lines, and not winged. Flowers wanting in our specimens, but according to A. Cunningham, he found a single one which had 10 free stamens. Fruit in the specimens which I have seen globular, from 1 to $1\frac{1}{2}$ in. diameter, with a hard rind; cells 6 to 8, more or less pulpy, with usually 3 or 4 seeds in each.—*Limonia australis*, A. Cunn. in Sweet. Cat.

Queensland. Brisbane river, A. Cunningham, *Fraser*; Moreton Bay, *Leichhardt*. Cunningham's specimens of this the "Native Orange" are in leaf with fruits attached; Leichhardt's are only loose fruits. All our specimens in flower have much narrower leaves, and I therefore refer them to the following species, to which also probably belongs the polymorphous flowering specimen described by Planchon.

2. ***C. australasica***, *F. Muell. Fragm.* i. 26. A rigid shrub (according to A. Cunningham), quite glabrous, with axillary straight slender spines of $\frac{1}{2}$ in. or less. Leaves from obovate-oblong to oblong-cuneate or lanceolate, very obtuse and emarginate, 1 to $1\frac{1}{2}$ or rarely 2 in. long, coriaceous, the petiole usually very short, and not winged. Flowers solitary or rarely 2 together, on very short pedicels. Sepals 5, small, spreading, concave, minutely ciliate. Petals oblong, nearly 4 lines long. Stamens 20 to 25, free. Ovary in the flowers examined 6-celled. Style very short, with a thickened, obtuse, furrowed stigma. Ovules 4 in each cell. Fruit oblong, almost cylindrical,

2 or 3 times as long as broad, the largest seen about 2 in. long, with usually 2 or 3 seeds in each cell.

Queensland. Brisbane river, *A. Cunningham*, *P. Mueller*, and others; Pine river, *Fitzalan*.

N. S. Wales. Clareuc river, *Beckler*; Richmond river, *Herb. Mueller*.

The specimens are very unsatisfactory; several with the narrowest leaves are in leaf only, others with rather broader leaves are in flower. None have the fruit attached; the loose fruits are deposited in *P. Mueller*'s herbarium as belonging to one of the narrow-leaved specimens. The evidence, therefore, which has induced me to refer the flowering specimens with numerous stamens to the oblong rather than to the globular fruits, is far from conclusive, and the question cannot be determined until undoubted flowers of the globular-fruited tree shall have been more fully examined.

ORDER XXIX. SIMARUBÆ.

Flowers regular, dioecious or polygamous, more rarely hermaphrodite. Calyx usually small, 3- to 5-lobed, or divided into as many distinct sepals. Petals 3 to 5, hypogynous or slightly perigynous, imbricate or valvate in the bud, rarely wanting. Stamens either equal in number to the petals, and alternating with them, or double the number, anthers usually versatile, with 2 parallel cells opening longitudinally. Disk annular, cupular or elongated within the stamens, under or round the ovary, or rarely none. Gynoecium of 3 to 5, rarely more or fewer carpels, quite distinct, or more or less united into a single lobed or rarely entire ovary, with one cell to each carpel. Styles as many as carpels, united from the base or by the stigmas only, or entirely distinct. Ovules solitary in each cell, or very rarely 2, the micropyle superior. Fruit-carpels either distinct, dry or drupaceous, usually indehiscent, or united in a single drupe or capsule. Seeds usually solitary in each carpel or cell, pendulous; testa membranous; albumen abundant, or little, or none. Embryo straight or curved; cotyledons flat or convex, rarely twisted; radicle superior.—Shrubs or trees, with a bitter bark. Indumentum of simple not stellate hairs. Leaves alternate or rarely opposite, pinnate or simple, usually without glandular dots. Stipules none, except in *Cadellia*. Flowers usually small, in axillary or rarely terminal panicles or racemes.

The Order consists of a considerable number of small genera, chiefly tropical, dispersed over the New as well as the Old World. Of the 6 Australian genera, 3 belong to tropical Asia, one of which extends also into Africa, 2 are endemic, and the sixth is on the seacoasts of all tropical countries. The Order as a whole is somewhat heterogeneous, and especially has no peculiar habit. In technical characters it is closely allied to *Rutaceæ*, from which it differs chiefly in the bitter bark, the want of pellucid dots to the leaves, and in the solitary ovules, but each of these characters has some exceptions.

TRIBE I. *Simarubæ*.—Ovary lobed or carpels distinct.

Leaves pinnate.

Stamens twice as many as petals. Fruit-carpels winged and samara-like 1. *AILANTHUS*.

Stamens equal in number to the petals. Fruit-carpels drupaceous 2. *BRUCEA*.

Leaves simple. Stamens twice as many as petals.

Calyx very small. Styles connate 3. *HYPTIANDRA*.

Sepals nearly or quite as long as the petals. Styles free.

Sepals spreading under the fruit. Leaves thin 4. *CADELLIA*.

Sepals connivent over the fruit. Leaves almost fleshy 5. *SURIANA*.



TRIBE II. **Picramniæ**.—*Ovary entire.*Leaves 3-foliate 6. **HARRISONIA**.TRIBE I. **SIMARUBÆ**.—Ovary deeply divided, the carpels or lobes entirely distinct or connected by the styles or stigmas.1. **AILANTHUS**, Desf.

Flowers polygamous. Calyx small, 5-lobed. Petals 5, valvate in the bud. Disk 10-lobed. Stamens 10, fewer or none in the female flowers; filaments without scales. Ovary 2- to 5-lobed; styles connate, with plumose stigmas; ovules solitary in each cell. Fruit of 1 to 5, oblong, membranous samarae, thickened in the centre round the seed. Seed flattened; testa membranous; albumen scanty; cotyledons leafy, nearly orbicular.—Trees. Leaves alternate, pinnate; leaflets oblique. Flowers small, in terminal panicles.

Besides the Australian species, which is endemic, the genus comprises three others, natives of the warmer regions of Asia, one of them much planted in various parts of the globe.

1. **A. imberbiflora**, F. Muell. *Fragm.* iii. 42. A tree, quite glabrous in all its parts. Leaflets about 15 to 17, shortly petiolulate, apparently obliquely ovate-lanceolate and 2 or 3 in. long, but much broken in the only specimens seen. Panicles not much branched. Male flowers on short pedicels, in little clusters along the upper part of the branches. Calyx very small. Petals about $1\frac{1}{4}$ lines long, quite glabrous, valvate, not induplicate, and the points scarcely inflexed. Stamens exserted. Female flowers not seen. Samarae in our specimens attaining at least 2 in. in length and $\frac{1}{2}$ in. in breadth.

Queensland. Rockhampton, Thozet. Evidently, as suggested by F. Muell. r, very nearly allied to the E. Indian *A. malabarica*, DC. *Prod.* ii. 89, Wight, Ic. t. 1604, which indeed seems only to differ in a slight pubescence on the panicle and in rather larger flowers and fruits.

A. rhodoptera, F. Muell. *Fragm.* iii. 43, mentioned as cultivated in New England, is the commonly planted *A. glandulosa*, Desf., DC. *Prod.* ii. 89. *A. paniculata*, F. Muell. I. c., is *Peucedanum australis*, Hook. f., of which the fruit closely resembles that of an *Ailanthus* in outward form, although the inner structure as well as the flower are very different.

2. **BRUCEA**, Mill.

Flowers polygamous. Calyx small, 4-cleft. Petals 4, minute, linear, imbricate in the bud. Disk 4-lobed. Stamens 4. Ovary 4-lobed or of 4 distinct carpels, the styles free or connate at the base, the stigmas entire, spreading; ovules solitary in each cell. Drupes 4, ovoid, scarcely fleshy, the putamen rugose. Seed with a membranous testa; albumen copious; embryo straight, radicle superior. Trees. Leaves alternate, pinnate; leaflets oblique. Flowers very small, in small cymes, in simple slender axillary spikes.

The genus comprises a very few species, spread over tropical Asia and Africa, extending into northern India. The Australian species is one of the commonest Asiatic ones.

1. **B. Sumatrana**, Roxb. *Fl. Ind.* i. 449. A shrub or tree, the young branches and petioles softly tomentose. Leaves 1 to $1\frac{1}{2}$ ft. long or even more; leaflets 5 to 11, ovate-lanceolate, acuminate, about 3 in. long, coarsely toothed, usually oblique at the base, softly pubescent or tomentose-villous,

especially underneath. Flowers very small, purple, in little cymes or clusters along the peduncle, forming interrupted spikes or racemes of 6 to 10 in. in the males, much shorter in the females. Drupes about 3 lines long.

N. Australia. Arnhem's Bay, *R. Brown*; Victoria river, *F. Mueller*. The latter specimen has the leaflets very densely and softly velvety on both sides; in *R. Brown's* specimen they are not more so than in the majority of Indian specimens. (*Herb. R. Br.* and *F. Muell.*)

3. HYPTIANDRA, Hook. f.

Flowers hermaphrodite. Calyx small, of 4 or 5 distinct sepals. Petals 4 or 5, imbricate in the bud. Disk thick. Stamens 8 or 10; filaments flattened, densely villous. Ovary of 4 or 5 distinct carpels, connected upwards by a short style; stigma inconspicuous. Ovules solitary in each cell or accompanied by a second smaller abortive one. Fruit unknown.—A shrub or tree, pubescent with simple hairs. Leaves alternate, simple. Flowers axillary.

The genus is limited to a single species, endemic in Australia. We had, in our 'Genera Plantarum,' placed it doubtfully amongst *Rubiaceæ-Boroniae*, with which it is closely connected by the flowers, but, on further consideration, the want of glandular dots, the bitter bark, and simple hairs have induced us to remove it to *Simarubeæ*.

1. **H. Bidwilli**, *Hook. f. in Benth. and Hook. Gen. Pl.* 294. Probably a tall-creep shrub or tree, the young shoots silky-pubescent with appressed simple hairs. Leaves petiolate, lanceolate, narrowed at each end, but usually obtuse, 3 to 4 in. long, entire, coriaceous, glabrous on both sides, or with a few small appressed hairs on the veins underneath, not dotted. Flowers small, shortly pedicellate, in axillary clusters, with a few appressed strigose hairs on the pedicels and petals. Petals ovate, much imbricate, rather more than 1 line long. Filaments dilated to above the middle and fringed, especially inside, with long hairs. Ovary hirsute.

Queensland. Wide Bay, *Bidwill*.

4. CADELLIA, F. Muell.

Flowers hermaphrodite. Sepals usually 5, nearly as long as the petals, enlarged and stellately spreading under the fruit, imbricate in the bud. Petals 5, imbricate in the bud. Stamens 10; filaments filiform. Disk none. Carpels 1 or 5, free; styles distinct, inserted on the inner angle above or below the middle; stigmas dilated or capitellate; ovules 2 in each carpel, collateral, pendulous or ascending. Fruit-carpels coriaceous, small, indehiscent or obscurely 2-valved. Seeds solitary, without albumen; testa membranous; embryo curved.—A tree. Leaves alternate, simple, with small, often deciduous stipules. Flowers in short loose axillary racemes.

The genus is limited to Australia. It only differs from *Suriana* in the arborescent habit and thinner spreading calyx.

Carpels 5. Leaves mostly obtuse. Racemes very loose 1. *C. pentastylis*.
Carpels solitary. Leaves mostly acute or acuminate. Racemes short . 2. *C. monostylis*.

1. **C. pentastylis**, *F. Muell. Fragm.* ii. 25, t. 12. A tree, attaining 40 ft., the smaller branches very slender and minutely pubescent. Leaves from obovate-oblong to elliptical or lanceolate, obtuse, about 1½ to 2 in. long.



Gadolliopsis tenuistylis

entire, narrowed into a short petiole, occasionally bearing a gland on one side, glabrous, penninerved and reticulate, not dotted. Peduncles in the upper axils slender, bearing a short raceme of 2 to 4 flowers. Sepals nearly 3 lines long at the time of flowering, enlarged to 5 or 6 lines, and stellately spreading under the fruit. Petals white, slightly exceeding the sepals. Carpels 5, the styles inserted above the middle. Ovules pendulous. Drupes about $1\frac{1}{2}$ lines long, nearly globular, with an inner angle, somewhat coriaceous, with a crustaceous endocarp. Embryo much curved or circinate like that of *Suriana*; cotyledons much broader than in that plant, variously folded according to F. Mueller, in the seed I opened flat, except following the general curvature of the embryo.

N. S. Wales. Rocks at the falls of the Severn in New England, near Tenterfield, C. Stuart.

2. **C. monostylis**, Benth. A glabrous slender tree (or shrub?). Leaves petiolate, from ovate-lanceolate to elliptical-oblong, shortly acuminate, mostly 3 to 4 in. long, narrowed at the base, membranous or thinly coriaceous. Racemes, in the few specimens seen, very short, slender, 2- to 4-flowered. Pedicels about 2 lines long, in the axils of minute bracts. Sepals nearly 2 lines long, shortly united at the base, membranous, persistent, and spreading after flowering. Petals (1 only seen) about twice as long as the sepals. Stamens 10, but in some of the flowers 1 or 2 are semiabortive (or already withered away?). Carpels in all the flowers seen solitary, with the style quite basal as in *Suriana*. Ovules as in *C. pentastylos*, collateral, but horizontal or slightly ascending.

N. S. Wales. Clarence river, Beekler. The specimens seen are very few with very few flowers, the petals already almost all fallen away.

5. **SURIANA**, Linn.

Flowers hermaphrodite. Sepals 5, as long as the petals, persistent and closing over the fruit, imbricate in the bud. Petals 5, imbricate in the bud. Stamens 10, filaments filiform. Disk none. Carpels 5, free; styles distinct, filiform, inserted near the base of the carpels; stigmas capitate; ovules 2 in each carpel, ascending. Fruit-carpels coriaceous, indehiscent. Seeds solitary, ascending, without albumen; testa membranous; embryo curved.—A maritime shrub. Leaves alternate, simple. Peduncles in the upper axils 1- or few-flowered.

The genus is limited to a single species widely spread over the seacoasts of most tropical countries. It is in many respects anomalous in the structure of the flowers, but is certainly allied to *Cneorum* and *Castela*, and, with them, appears to be better placed among *Simarubæ* than in any other Order to which it has been referred, although it is deprived of the bitter principle of the majority of *Simarubæ*.

1. **S. maritima**, Linn.; W. and Arn. Prod. 361. A rigid, much-branched shrub, more or less hoary or tomentose with simple, often capitate hairs. Leaves crowded, linear-spathulate, obtuse, 1 to $1\frac{1}{2}$ in. long, narrowed at the base, quite entire, rather thick, scarcely veined. Peduncles short in the upper axils, bearing 1 or very few flowers, often forming short leafy terminal corymbs. Sepals rather thick, acute or acuminate, 3 to 4 lines long, slightly enlarging and closing over the fruit. Petals yellow, scarcely as long as the

sepals. Nuts or drupes about half as long as the calyx, minutely pubescent, with a thin epicarp and crustaceous endocarp. Embryo in the seeds examined as much curved as in *Cadellia*, but the cotyledons narrower.

Queensland. Islands off the N.E. coast, *R. Brown*, *F. Mueller*, and others.

TRIBE II. PICRAMNIÆ.—Ovary 2- to 5-celled, entire or rarely shortly lobed.

6. HARRISONIA, R. Br.

Flowers hermaphrodite. Calyx small, 4- or 5-cleft. Petals 4 or 5, almost valvate. Disk hemispherical or cupular. Stamens 8 or 10, with a small 2-cleft scale at the base of the filaments. Ovary globular, entire or shortly lobed, 4- or 5-celled. Styles connate or distinct at the base; stigma furrowed. Ovules solitary in each cell, pendulous. Drupe small, globular, with 2 to 5 pyrenes or nuts. Seeds solitary, nearly globular; testa rather thick; albumen scanty; cotyledons folded towards the middle.—Trees, usually armed with prickles. Leaves alternate, compound. Flowers small, in pedunculate axillary cymes.

The genus comprises only two species, natives of the Indian Archipelago, one of them extending to Australia.

1. **H. Brownii**, *A. Juss. in Mem. Mus. Par.* xii. 540, t. 28. A shrub. Branches glabrous, often armed with short conical prickles, usually in pairs, one on each side of the leaf, but probably not really stipular. Leaflets 3, ovate, acuminate, 1½ to 3 in. long, the lateral ones petiolulate and oblique at the base, the terminal one narrowed at the base; all glabrous or sprinkled with a few hairs underneath. Flowers small, few together in axillary cymes, on slender peduncles, shorter than the leaves. Calyx and petals quite glabrous. Filaments hairy at the base. Drupe small, depressed, globular, furrowed between the nuts.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown* (*Herb. R. Br.*). We have it also from Timor and from the Philippine Islands, and it probably extends over other intervening islands.

ORDER XXX. BURSERACEÆ.

Flowers regular, hermaphrodite or polygamous. Calyx usually small, 3- to 5-lobed or divided into as many distinct sepals. Petals 3 to 5, hypogynous or perigynous, imbricate or valvate in the bud. Stamens twice as many as petals, or rarely of the same number, inserted on or around the disk; anthers versatile, with 2 parallel cells opening longitudinally. Disk usually annular or cupular, often adnate to the base of the calyx. Ovary free, 2- to 5-celled, tapering into a single style, with an entire or lobed stigma. Ovules 2 in each cell or rarely solitary, usually pendulous, the micropyle superior. Fruit a drupe, either indehiscent or the epicarp opening in 2 valves, pyrenes 2 to 5, bony or chartaceous, distinct or united. Seeds solitary in each pyrene, pendulous; testa membranous; albumen none. Cotyledons usually membranous, folded or rarely thick and fleshy.—Shrubs or trees, often yielding a balsamic fluid. Leaves usually alternate, pinnate, or in genera not Aus-

tralian 3-foliolate, without or rarely with stipules. Flowers small, in racemes or panicles.

The Order is spread over most tropical regions. The two Australian genera are both widely dispersed over tropical Asia, one is also in Africa, and the other in tropical America.

Calyx 5-lobed, the disk lining the tube, with the stamens on the margin . 1. GARUGA.
Calyx 3-lobed, the disk free, with the stamen outside or on the margin . 2. CANARIUM.

1. GARUGA, Roxb.

Flowers polygamous. Calyx campanulate, 5-lobed, valvate. Petals 5, inserted above the middle of the calyx-tube, induplicate-valvate. Disk thin, lining the calyx-tube. Stamens 10, inserted with the petals. Ovary 4- or 5-celled; styles elongated; ovules 2 in each cell. Drupe indehiscent, with 5 or fewer bony nuts, rugose outside. Seeds solitary in each nut; cotyledons folded. Trees. Leaves pinnate. Flowers rather large for the Order, in terminal panicles.

The genus is dispersed over tropical Asia and America; the Australian species extends at least to Timor, and is perhaps a variety of a common Asiatic one.

1. **G. floribunda**, Dene. *Herb. Tim. Deser.* 149. Branches thick, marked with the broad scars of the fallen leaves. Leaves crowded at the ends of the branches; leaflets 7 or 8 pairs, very shortly petiolulate, very obliquely ovate-lanceolate, acuminate, 2 to 3 in. long, crenate especially on the outer edge, glabrous when full grown, the common petiole 8 in. to 1 ft. long, slightly pubescent or at length glabrous. Panicles broad and dense, terminating leafless branches. Flowers numerous, much smaller than in the common Indian *G. pinnata*, Roxb., arranged in cymes along the last ramifications, the pedicels and flowers hoary with a minute tomentum. Calyx about 2 lines long. Petals linear-oblong, twice as long as the calyx-lobes. Fruit not seen.

N. Australia. Port Nelson, N.W. coast, *A. Cunningham*. I have followed Planchon (in *Herb. Hook.*) in referring this to the Timor species described by Decaisne, although I have seen no specimens from that island. It differs from some forms of *G. pinnata*, Roxb., in little besides the much smaller flowers in a more compound panicle.

2. CANARIUM, Linn.

Flowers hermaphrodite or polygamous. Calyx campanulate, usually 3-lobed, valvate. Petals usually 3, valvate, or slightly imbricate in the bud. Disk annular, rather thick. Stamens twice as many as petals, inserted on the margin of or outside the disk. Ovary usually 3-celled; stigma sessile, capitate, 3-lobed; ovules 2 in each cell. Drupe ovoid or ellipsoid, often 3-angled, the putamen 1-celled by abortion. Seed solitary; testa membranous; cotyledons folded. —Trees, with large pinnate leaves. Flowers small, in axillary panicles.

The largest genus of the Order, dispersed over tropical Asia and especially the Indian Archipelago, with a few African species. The Australian one is endemic.

1. **C. australasicum**, F. Muell. *Fragm.* iii. 15. Branches thick, marked with the broad scars of fallen leaves, the young ones minutely hoary. Leaflets 5 to 9, petiolulate, ovate or oval-oblong, or the lower ones nearly

orbicular, very obtuse, or rarely shortly acuminate, 2 to 4 in. long, glabrous, coriaceous, with parallel pinnate veins, and smaller reticulations conspicuous on both sides. Stipules linear-subulate, deciduous. Panicles raceme-like in the upper axils, shorter than the leaves, the cymes shortly pedunculate along the simple rhachis. Bracts and bracteoles small, deciduous. Flowering calyx 1 line long, tomentose. Petals about 2 lines, glabrous. Stamens 6, the filaments shortly united in a cup at the base. Drupes ellipsoid, the woody nut nearly 1 in. long, smooth, usually 1-celled, rarely with 2 cells and seeds. Cotyledons much folded and crumpled.

N. Australia. Carcening Bay, N.W. coast, *A. Cunningham*; Port Essington, *Armstrong*; islands of the Gulf of Carpentaria, *R. Brown, Henne*.

Queensland. Estuary of the Burdekin, *Fitzalan*. The species does not come very near to any other one known to me.

ORDER XXXI. MELIACEÆ.

Flowers regular, usually hermaphrodite. Calyx small, 4- or 5-lobed, or divided into as many distinct sepals. Petals 4 or 5, rarely more, or 3 only, free or adnate to the staminal tube, imbricate or rarely valvate. Stamens as many, or more frequently twice as many, as petals; the filaments, in *Meliaceæ* proper, united in a tube; anthers sessile or shortly stipitate within, or at the summit of the tube; in *Cedrelæ*, filaments free. Disk various, often annular or tubular, free within the staminal tube. Ovary free, entire, 3- to 5-celled; style simple; stigma thick, disk-shaped or pyramidal. Ovules in each cell 2, or (in *Carapa* and the *Cedrelæ*) 1 or more, the micropyle superior. Fruit a capsule, berry, or rarely a drupe, indehiscent, or septicidally or loculicidally dehiscent. Seeds 1, rarely 2, or in *Cedrelæ* few in each cell, with a ventral hilum; albumen fleshy or none, embryo flat or nearly so, radicle superior.—Trees or shrubs, the wood often coloured and sometimes fragrant, the bark rarely bitter. Leaves alternate or very rarely opposite, simple, or more frequently pinnate, the petiole often continuing long to grow out and produce fresh leaflets; leaflets without dots, except in *Flindersia*. Flowers paniculate, often small.

The Order is found abundantly in the tropical or warm regions of Asia and America, more rarely in Africa. Of the 10 Australian genera, 3 are endemic, 3 are common to the tropical regions both of the New and the Old World, the remaining 4 are Asiatic, one of them extending also into Africa.

Meliaceæ proper are at once known among the allied Orders by their staminal tube. *Cedrelæ*, with free stamens, are in that respect anomalous, and might technically be referred to some of the preceding Orders containing pinnate-leaved trees; but the habit, the large disk-like stigma, and some minor characters, have referred them with common consent to *Meliaceæ* as a tribe. *Flindersia*, however, with its pellucid-dotted leaves, is really as nearly connected with *Rutaceæ-Zanthoxylaceæ* as with *Meliaceæ*, but retained among the latter on account of its fruit and seeds so nearly those of *Cedrelæ*.

TRIBE I. *Meliæ*.—Stamens united in a tube. Ovules 2 in each cell. Seeds not winged, albuminous.

Leaves simple. Petals very long and narrow. 1. *TURREA*.
Leaves bipinnate. 2. *MELIA*.

TRIBE II. *Trichilieæ*.—Stamens united in a tube. Ovules 2, rarely 1, or (in *Carapa*) more than 2 in each cell. Seeds not winged, without albumen. Leaves pinnate. Disk tubular or cup-shaped, enclosing the ovary 3. *DYSOXYLON*.

Disk annular, or undistinguishable from the thickened base of the ovary.

Stamens equal in number to or not twice as many as petals. Flowers very small, globular	4. AGLAIA.
Stamens twice as many as petals.	
Staminal tube truncate or scarcely crenulate, the anthers included or scarcely protruding. Capsule hard.	5. AMODRA.
Ovules 1 (rarely 2 superposed) in each cell	6. SYNOUM.
Ovules 2, parallel, attached to a pendulous placenta, which in the fruit is a thick arillus between the two seeds	7. OWENIA.
Staminal tube toothed, with the anthers protruding between the teeth. Ovules solitary. Drupe globular, with a woody or stony pitamen	8. CARAPA.
Staminal tube truncate or crenate. Ovules more than 2 in each cell. Leaflets reticulate	9. CEDRELA.
TRIBE III. <i>Cedreleæ</i> .—Stamens free. Ovules more than 2 in each cell. Seeds winged. Leaves pinnate or rarely simple.	10. FLINDERSIA.
Petals erect. Disk thick. Capsule smooth. Leaves not dotted	
Petals spreading. Disk broadly cupular. Capsule muricate. Leaves pellucid-dotted	

TRIBE I. MELIÆ.—Stamens united in a tube. Ovules 2 in each cell. Seeds not winged, albuminous. Leaves various.

1. TURRÆA, Linn.

Calyx 4- or 5-toothed or lobed. Petals 4 or 5, elongated, free. Staminal tube cylindrical, toothed at the summit, anthers 8 or 10, within the summit of the tube. Disk annular or none. Ovary 5-, 10- or 20-cell'd; style filiform, with a disk-like stigma; ovules 2 in each cell, superposed. Capsule 5- or several-celled, opening loculicidally in as many coriaceous valves. Seeds oblong, with a broad ventral hilum, sometimes winged; albumen fleshy, cotyledons leaf-like.—Trees or shrubs. Leaves simple. Peduncles axillary, bearing few, white flowers.

The genus extends over tropical Asia and Africa; the Australian species is found also in the Indian Archipelago.

1. *T. pubescens*, Hellen.; Willd. Spec. Pl. ii. 555. A shrub or small tree. Leaves at the time of flowering small, from obovate and emarginate to ovate-lanceolate and acuminate, pubescent as well as the young shoots; when full-grown ovate, shortly acuminate, 2 to 3, or even 4 in. long, somewhat coriaceous, quite glabrous or slightly pubescent underneath. Flowers white, sweet-scented, in axillary clusters or short racemes of 3 to 6. Petals narrow, linear-spathulate, 1 to $1\frac{1}{2}$ in. long. Staminal tube rather shorter, with 10 short teeth, each one more or less divided into 2 to 4 lobes, or rarely entire. Style exserted. Fruit nearly globular, 5-celled, furrowed opposite the dissepiments, 3 to 4 lines diameter in some specimens, $\frac{1}{2}$ in. in others, opening loculicidally in 5 valves, leaving the greater part of the membranous dissepiments attached to the axis. Seeds not winged.—*T. Billardieri*, A. Juss. in Mem. Mus. Par. xix. 218; Benn. Pl. Jay. Rar. 181 (from the character given); *T. concinna*, Benn. Pl. Jay. Rar. 182.

Queensland. Broad Sound, Keppel Bay, etc., R. Brown; Cape York, McGillivray; Sunday Island, N.E. coast, A. Cunningham; Burdekin and Pine rivers, Ed. alpin; Tarana hills, Leichhardt; Rockhampton, Thozet; Mount Lindsay, W. Hill.

The species appears to be generally dispersed over the Indian Archipelago; the lobes of the teeth of the staminal tube, upon which the distinction of *T. pubescens*, *T. Billardieri*, and *T. concinna* is chiefly founded, are very variable, even on the same specimen.

2. MELIA, Linn.

Calyx 5- or 6-cleft. Petals 5 or 6, linear-spathulate, spreading. Staminal tube 10- or 12-toothed; anthers 10 or 12, within the summit. Disk annular. Ovary 3- to 6-celled; style slender, with a capitate lobed stigma; ovules 2 in each cell, superposed. Drupe succulent, with a bony 1- to 5-celled putamen. Seeds solitary in each cell; testa crustaceous; albumen fleshy, sometimes scanty or none, cotyledons leaf-like.—Trees. Leaves usually twice or thrice pinnate, with petiolulate toothed leaflets. Flowers paniculate.

The genus comprises but very few species, natives of tropical Asia, one of them generally planted in many parts of the globe. The Australian species is one of the Asiatic ones.

1. **M. composita**, Willd.; *W. and Arn. Prod.* 117. An elegant tree, the young leaves, shoots, and inflorescence sprinkled with a mealy stellate tomentum which disappears with age. Leaves twice or rarely thrice pinnate; leaflets petiolulate, opposite with a terminal odd one, ovate to almost lanceolate, acuminate, 1 to 2 in. long, entire, coarsely toothed or sometimes lobed. Panicles loose, shorter than the leaves, retaining the mealy tomentum late, especially on the calyx and petals. Sepals small, ovate. Petals 4 to 5 lines long. Staminal tube hirsute inside behind the anthers, the teeth alternately entire and 2-cleft; anthers glabrous or slightly hirsute. Ovary 5-celled. Drupe ovoid, $\frac{1}{2}$ to $\frac{3}{4}$ in. long.—*M. australasica*, A. Juss. in *Mem. Mus. Par.* xix. 257.

N. Australia. Albert river, Henne.

Queensland. Burdekin river, F. Mueller; Broad Sound, R. Brown; Rockhampton, Thozet.

N. S. Wales. Macleay, Hastings, and Clarence rivers, Beckler; Newcastle, Leichhardt.

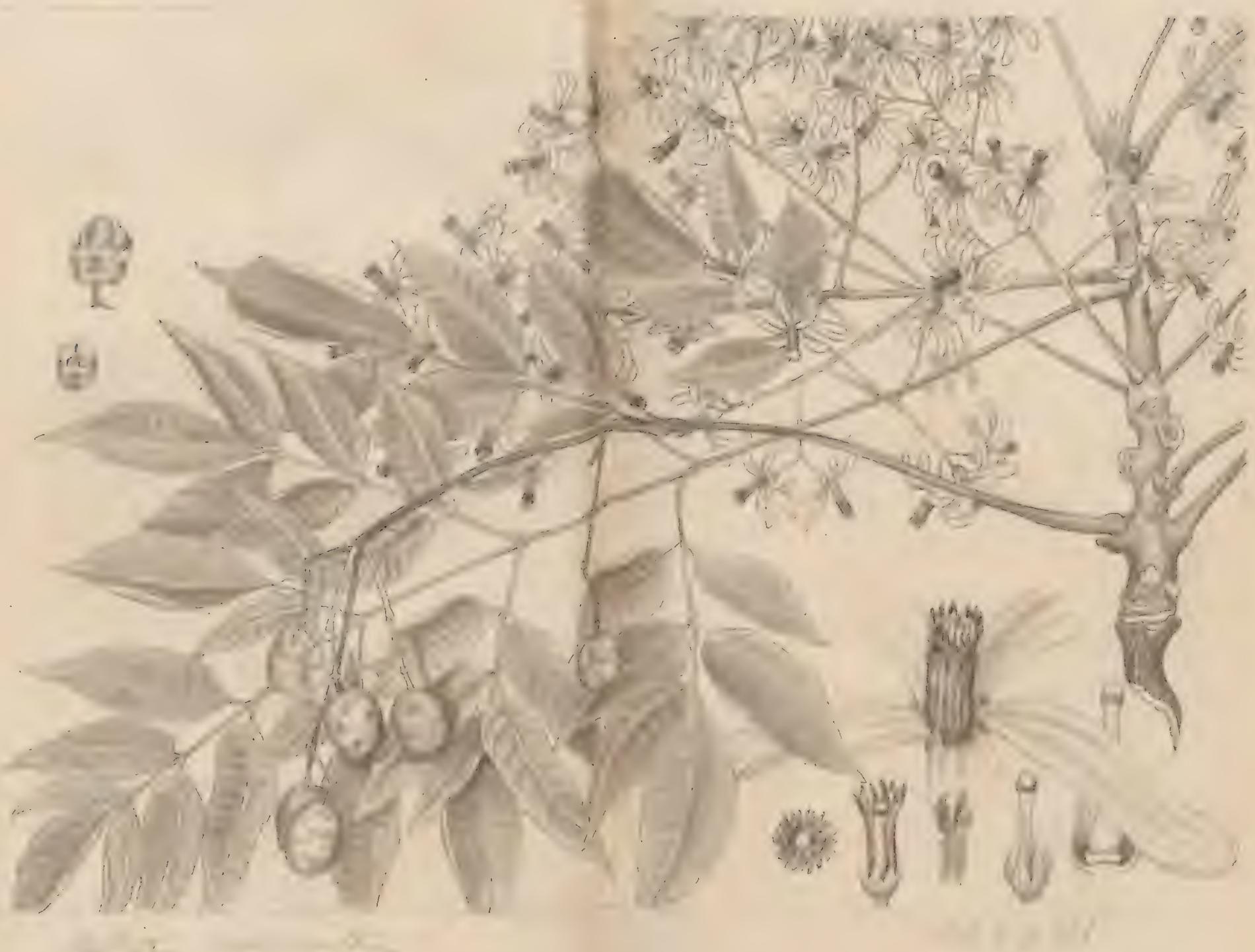
The Australian tree appears to me identical with the *M. composita* of East India and the Archipelago, and scarcely differs from the more common *M. Azedarach*, except in the more abundant mealy tomentum, especially on the inflorescence and flowers. The drupe is also usually larger and more ovoid.

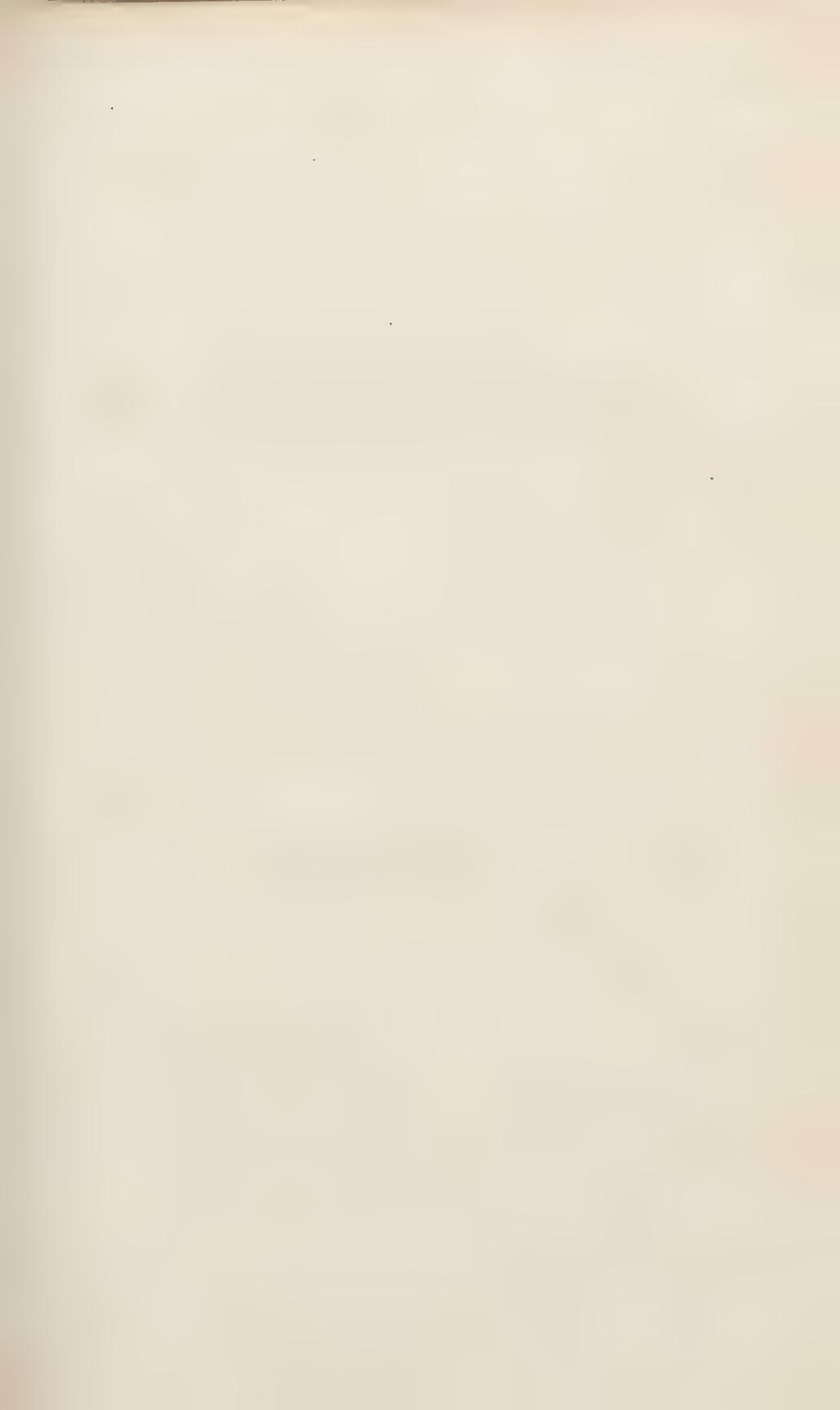
3. DYSOXYLON, Blume.

(*Hartigsea*, A. Juss.)

Calyx small, 4- or 5-toothed, or divided into 4 or 5 sepals. Petals 4 or 5, free or adnate to the staminal tube, spreading at the top. Staminal tube truncate or 8- or 10-toothed; anthers 8 or 10, within the summit. Disk tubular, as long as or usually much longer than the ovary. Ovary 3- to 5-celled; style elongated; stigma disk-like; ovules 2 in each cell, or rarely solitary. Capsule globular or pear-shaped, 1- to 5-celled, opening loculicidally in 2 to 5 thickly coriaceous valves. Seeds with or rarely without an arillus, oblong, with a broad ventral hilum; testa coriaceous; albumen none; cotyledons large.—Trees, often fætid. Leaves pinnate, leaflets opposite or alternate in the same species, entire, often oblique. Panicles axillary, loose, but often small. Flowers not very small.









Platycerium

A considerable genus, spread over tropical Asia and the Indian Archipelago, extending also to New Zealand. The Australian species are all endemic. The genus is readily known by the tubular disk enclosing the ovary within the staminal tube.

Calyx cupular, shortly toothed. Petals free. Flowers 4-merous.

- Ovary-cells 2, 2-ovulate 1. *D. latifolium*.
- Calyx cupular, shortly toothed or lobed. Petals adnate to the staminal tube.

 - Flowers 4-merous. Ovary-cells 3, 2-ovulate. Leaflets 5 to 9.
 - Panicles small, loose. Tubular disk short and broad 2. *D. Fraseranum*.
 - Flowers 4-merous. Ovary-cells 4, 1-ovulate. Leaflets 11 to 21.
 - Panicles large. Staminal tube hirsute. Tubular disk long and slender 3. *D. Muelleri*.
 - Flowers 4- or 5-merous. Ovary-cells 4 or 5, 1-ovulate. Leaflets 4 to 6. Panicles loose, few-flowered. Staminal tube glabrous 4. *D. Lessertianum*.
 - Calyx of 5 distinct sepals. Petals adnate to the staminal tube.
 - Flowers 5-merous. Ovary-cells 5, 2-ovulate 5. *D. rufum*.

1. ***D. latifolium*, Benth.** Leaves glabrous; leaflets in our specimens 4 or 5, ovate or broadly oval-oblong, shortly acuminate, 3 to 4 in. long, oblique at the base, somewhat coriaceous. Flowers in sessile or shortly pedunculate clusters, along a simple, axillary, nearly glabrous peduncle of 4 to 5 in. Pedicels short, slightly pubescent. Calyx cupular, not 1 line long, with 4 very short broad teeth. Petals 4, pubescent outside, about 3 lines long, valvate in the bud, free from the staminal tube. Staminal tube truncate, and shortly and irregularly 8-toothed. Disk broadly tubular, sprinkled with a few minute hairs. Ovary, in the flowers examined, 2-celled, with 2 ovules in each cell, pubescent, tapering into an elongated style; stigma disk-like. Fruit not seen.

Queensland. Frankland Islands, *M'Gillivray*.

2. ***D. Fraseranum*, Benth.** A tree of 80 to 130 ft., the young leaves and shoots slightly pubescent, glabrous when full-grown. Leaflets 5 to 9, oblanceolate or elliptical, acuminate, 3 to 6 in. long, narrowed and equal at the base, bearing occasionally tufts of hairs in the axils of the principal veins underneath. Panicles in the upper axils short, loose, divaricately branched, slightly pubescent. Calyx cupular, about 1 line long, shortly and broadly 4-lobed. Petals 4, about 3 lines long, nearly glabrous, adnate to the staminal tube to about half their length. Staminal tube 8-toothed, glabrous outside. Disk broadly tubular, rather longer than the ovary. Ovary hirsute, 3-celled, with 2 ovules in each cell. Fruit not seen.—*Hartigsea Fraserana*, A. Juss. in Mem. Mus. Par. xix. 262, t. 15.

N. S. Wales. Hastings river, *Fraser*; Woods of Paris Exhibition, n. 238, *M'Arthur*.

3. ***D. Muelleri*, Benth.** A tree of 60 ft. or more, glabrous or nearly so, except the very young shoots and inflorescence. Leaves 1 to 2 ft. long; leaflets 11 to 21, from ovate to almost lanceolate, shortly acuminate, 3 to 6 in. long, very oblique at the base, one side rounded, the other truncate and shorter, almost coriaceous. Panicles pyramidal, $\frac{3}{4}$ to 1 ft. long, much-branched and many-flowered. Calyx cupular, $\frac{1}{2}$ to $\frac{3}{4}$ line long, pubescent, 4-lobed. Petals 4, nearly glabrous, about 5 lines long, adhering to the staminal tube to about two-thirds their length. Staminal tube truncate and minutely crenulate, hirsute outside. Disk narrow-tubular, nearly half as long

as the staminal tube. Ovary hirsute, 4-celled, with 1 ovule in each cell. Fruit only seen very young, soon becoming glabrous.

Queensland. Brisbane river, Moreton Bay, *W. Hill, F. Mueller.*

N. S. Wales. Clarence river, *Beckler.*

4. *D. Lessertianum*, *Benth.* Quite glabrous, or the young shoots and panicles minutely pubescent. Leaflets 1 to 10, usually without any terminal odd one, elliptical or lanceolate, shortly and obtusely acuminate, 4 to 5 in. long. Panicles loose, extra-axillary, 3 to 4 in. long. Calyx short, cupular, entire or irregularly crenulate. Petals 4 or 5, glabrous, more or less adherent to the staminal tube at their base, rarely at length free. Staminal tube glabrous, 8- or 10-toothed. Tubular disk broad, scarcely longer than the ovary. Ovary hirsute, 4- or 5-celled, with 1 ovule in each cell. Fruit hard, obovoid, about $\frac{1}{2}$ in. long in the specimens seen. Arillus of the seeds thin. —*Hartigsea Lessertiana*, *A. Juss.* in *Mem. Mus. Par.* xix. 264.

N. S. Wales. Williams River, *R. Brown*; Clarence river, *Wilcox, Beckler.*

Var. *pubescens*. Young shoots, petioles, under side of the leaflets, and inflorescence softly pubescent. Clarence river, *Beckler* (*Hb. F. Muell.*).

5. *D. rufum*, *Benth.* A slender tree of 30 to 10 ft., the young branches, petioles, and under side of the leaves clothed with a soft often rust-coloured pubescence. Leaves $1\frac{1}{2}$ to 2 ft. long; leaflets numerous, very shortly petiolulate, ovate-lanceolate or lanceolate, acuminate, 3 to 6 in. long, very oblique at the base, glabrous on the upper side. Panicles axillary or lateral, not much branched, pubescent. Flowers sessile. Sepals 5, almost free, orbicular, imbricate, about 1 line long. Petals 5, pubescent, $\frac{1}{2}$ in. long, adhering to the staminal tube to about the middle. Staminal tube truncate, with 10 retuse short lobes or teeth; anthers tipped with a short point. Disk broadly tubular, very hairy. Ovary hirsute, 5-celled, with 2 ovules in each cell. Fruit depressed-globular, 1 in. diameter, densely hirsute with short, rigid, almost golden hairs. Seeds arillate. *Hartigsea rufa*, *A. Rich.* *Sert. Astral.* 29, t. 11.

Queensland. Moreton Bay, *A. Cunningham, W. Hill, F. Mueller.*

N. S. Wales. Port Macquarie, *A. Cunningham*; Hastings river, *Fraser*; Clarence river, *C. Moore*. The wood, known to the colonists as *Bastard Cedar-pencil wood*, is soft and easily worked, used in house-building.

Var. (?) *glabrescens*. Leaves quite glabrous. Fruit tomentose, with very short golden hairs.—Rockhampton, *Thozet.*

4. **AGLAIA**, *Lour.*

(*Milnea, Roxb.*; *Nemedra, A. Juss.*)

Flowers polygamous. Calyx 4- or 5-toothed or cleft. Petals 4 or 5, short, connivent, imbricate in the bud. Staminal tube globular or urceolate, entire or shortly toothed; anthers as many as petals or rarely more, within the summit of the tube. Disk none, or not distinct from the base of the ovary. Ovary 2- or 3-celled, with a short thick style and disk-like stigma; ovules 1 or 2 in each cell. Fruit coriaceous or almost succulent, indehiscent. Seeds 1 or 2, enveloped in a mealy pulp, without any arillus.—Trees, either glabrous or clothed with small scurfy scales or rarely with stellate tomentum.

Leaves pinnate, with entire leaflets. Flowers very small, nearly globular, in axillary panicles.

The genus is dispersed over tropical Asia and the islands of the Indian Archipelago and the Pacific. The only Australian species is also a native of New Caledonia and New Guinea.

1. **A. eleagnoides**, Benth. A tree of 20 to 30 ft., the young branches, inflorescence, and under side of the leaves covered with silvery or rust-coloured scurfy scales, often fringed at the edges. Leaflets 3 or rarely 5, petiolulate, ovate-oblong, or the terminal one obovate, acuminate, rarely ovate-lanceolate, 2 to 3 in. long or rarely more, coriaceous, glabrous above when full-grown. Flowers globular, about 1 line diameter, numerous in loose panicles which rarely exceed the leaves. Calyx shortly 5-, rarely 4-toothed. Petals 5, rarely 4, much imbricate, sprinkled as well as the ovary with the scurfy scales that cover the calyx and inflorescence. Anthers usually 5, but in some flowers 6, 7, or even more, within the short urceolate tube, which is thickened into raised filaments below the anthers. Ovary 3-celled, with 1 (or sometimes 2?) ovules in each cell. Fruit ovoid, about 1 in. long, covered with minute rust-coloured scurfy scales. Seeds 1 or 2, enveloped in a mealy pulp.—*Nemandra eleagnoides*, A. Juss. in Mem. Mus. Par. xix. 259, t. 14; *Aglia obovata*, Benth. in Hook. Lond. Journ. ii. 213, but probably not of Blume.

N. Australia. Islands of the Gulf of Carpentaria, R. Brown (specimens in fruit and flower), Entrecasteau Island, Endeavour Straits, Leichhardt, Loud. &c., in New Caledonia, the New Hebrides, and in New Guinea. The station, King George's Sound, given by A. de Jussieu on the authority of the Paris Herbarium, is evidently one of the errors of locality which occurs in many of the early collections of Australian plants deposited there. A. de Jussieu having found as many as 10 stamens, gives that as the typical number, although he observes at the same time that there are sometimes fewer. We, therefore, not having then any Australian specimens, failed to recognize his plant, and from the technical characters referred it in our 'Genera Plantarum' to *Amoora*. Having since, however, examined Leichhardt's and R. Brown's Australian specimens, and also some flowers from A. de Jussieu's specimens, kindly transmitted to me by M. Brongniart, I have been able satisfactorily to identify the species, which, notwithstanding an occasional increase in the number of stamens, belongs undoubtedly to *Aglaia*, a very natural genus if extended so as to include *Milnea*. In the majority of specimens examined I find almost always 5 stamens, and only now and then 6. Out of three unexpanded flowers from A. de Jussieu's plant, I found 7 stamens in two of them, and only 5 in the third.

5. AMOORA, Roxb.

Flowers polygamous. Calyx 3- to 5-toothed or lobed. Petals 3 to 5, imbricate in the bud, free from the staminal tube. Staminal tube urceolate or nearly globular, truncate or crenate; anthers within the tube, twice as many as petals. Disk none, besides the thickened base of the ovary. Ovary 3 to 5-celled or rarely 2-celled, with 1 or 2 superposed ovules in each cell; style short or long with a disk-like stigma. Capsule ovoid or globular, coriaceous or hard, opening loculicidally in 3 to 5 valves (or sometimes indehiscent?). Seeds solitary in each cell, enclosed in a fleshy arillus (or sometimes without an arillus?).—Trees. Leaves pinnate, with entire leaflets. Flowers small, but usually larger than in *Aglaia*.

The genus is spread over tropical Asia and the Indian Archipelago; the Australian species is endemic.

1. **A. nitidula**, Benth. A tall tree, quite glabrous. Leaflets 2 or 4,

opposite, without any terminal odd one, elliptical-oblong, 3 to 4 in. long or sometimes more, obtuse or shortly and obtusely acuminate, somewhat coriaceous and shining, narrowed at the base, the common petiole often slightly dilated towards the end. Panicles axillary, loose, but shorter than the leaves. Calyx very short, with 5 short teeth or lobes. Petals 5, about 2 lines long, glabrous or minutely ciliate. Staminal tube broadly ureolate; anthers 10; the tips slightly protruding. Ovary 2- or 3-celled, with 1 ovule in each cell. Fruit obovoid, hard and almost woody, narrowed almost into a stipe at the base, 2- or 3-celled. Seeds nearly globular, laterally attached near the top, apparently without any arillus.

Queensland. Moreton Bay, *W. Hill*.

N. S. Wales. Richmond and Clarence rivers, *Beckler*.

The species has much of the habit of some *Dysosyyla*, but the want of any free disk and the form of the staminal tube agree better with *Amoora*.

6. SYNOUM, A. Juss.

Calyx 4- rarely 5-cleft. Petals 4, rarely 5, valvate or slightly imbricate in the bud. Staminal tube cylindrical, slightly crenulate; anthers twice as many as petals, within the summit of the tube. Disk continuous with the thickened base of the ovary. Ovary 3-celled; style short, with a disk-like stigma; ovules 2 in each cell, attached collaterally to a thickish placenta pendulous from the apex of the cavity. Capsule 3-celled, opening loculicidally in 3 valves, or reduced by abortion to 2 valves and cells. Seeds 2 in each cell, attached by a broad lateral hilum, and half embedded collaterally in a fleshy arillus formed by the enlarged placenta.—A tree. Leaves pinnate, with entire leaflets.

The genus consists of a single species, limited to Australia.

1. **S. glandulosum**, *A. Juss. in Mem. Mus. Par.* xix. 227, *t. 15*. A moderate-sized tree, glabrous or the young leaves and shoots slightly silky-tomentose. Leaflets 5 to 9, elliptical-lanceolate, acuminate, mostly 2 to 3 in. long, narrowed at the base, somewhat coriaceous, the lateral veins few and scarcely prominent. Flowers in short dense axillary panicles, rarely exceeding 1 in. Sepals small, orbicular, spreading. Petals about $2\frac{1}{2}$ lines long. Staminal tube broad, slightly crenulate, glabrous or with a few hairs inside; anthers sometimes slightly protruding. Ovary villous. Capsule depressed-globular, glabrous, about $\frac{3}{4}$ in. diameter, furrowed opposite the dissepiments so as to be almost 3-lobed.—*Trichilia glandulosa*, *Sm. in Rees' Cycl.* xxxvi.

Queensland. Moreton Bay, *W. Hill*.

N. S. Wales. Sandy shores about Port Jackson, *R. Brown* and others; to the southward, *A. Cunningham*; inland to the Blue Mountains, *Miss Atkinson*; northward to Hastings river, *Beckler*. “Native Rosewood” of some colonists. It has the general habit of some *Dysosyyla*, but, besides the want of any free disk and the curious insertion of the ovules and seeds, it is easily recognized by its very short inflorescence.

7. OWENIA, F. Muell.

Sepals 5, short, orbicular, much imbricate. Petals 5, imbricate in the bud. Staminal tube short or long, with 10 entire or 2-lobed teeth; anthers protruding between the teeth. Disk small, annular or not distinct from the

ovary. Ovary 3- or 4-celled, or in one species 12-celled, with 1 ovule in each cell; style rather thick; stigma globular or conical, entire or lobed, on a disk-like expansion of the summit of the style. Drupe globular, the epicarp more or less succulent, putamen thick, woody or bony, rugose outside, 2- to 4-celled, or in one species 12-celled. Seeds solitary in each cell, the outer coating spongy, the hilum broad lateral; cotyledons oblong, thick.—Trees, with the juice often (perhaps always) milky, the young shoots often viscid or gummy. Leaves pinnate. Flowers small, in axillary panicles. Fruits rather acid, eaten by the aborigines.

The genus is endemic in Australia, and differs from all other known *Trichiliae* in its globular drupaceous fruit.

Leaflets numerous, lanceolate, acute.

- Leaflets 1-nerved. Panicles narrow. Flowers $2\frac{1}{2}$ lines long 1. *O. acidula*.
- Leaflets with the lateral veins conspicuous. Panicles divaricate. Flowers very numerous, about 1 line long 2. *O. vernicosa*.
- Leaflets 2 to 4 pairs, obtuse, pinninerved or reticulate.
 - Leaflets oblong or broadly lanceolate, narrowed at the base, quite glabrous. Fruit 4-celled 3. *O. venosa*.
 - Leaflets pubescent. Fruit 12-celled 4. *O. cerasifera*.
 - Leaflets large, ovate or ovate-lanceolate, broad and sessile at the base, very prominently reticulate underneath 5. *O. reticulata*.

1. ***O. acidula*, F. Muell.** in Hook. *Kew Journ.* ix. 304, and *Fragm.* iii. 14. A small or moderate-sized tree, glabrous, with the young shoots glutinous. Leaves crowded at the ends of the often pendulous branches; leaflets from 9 to nearly 30, linear-lanceolate, acute or mucronate, 1 to $1\frac{1}{2}$ in. long, oblique, the midrib prominent underneath, but otherwise almost nerveless, the common petiole 3 to 6 in. long. Panicles narrow, shorter than the leaves. Flowers nearly sessile, in clusters or on short branches of the panicle. Sepals about 1 line long. Petals about 2 lines. Teeth of the staminal tube subulate, but more or less connected by an undulate crenate or almost fringed membrane. Disk small, annular. Ovary 3-celled. Drupe $\frac{3}{4}$ to 1 in. or rather more in diameter, said to resemble a russet apple, the epicarp pulpy, of a rich crimson; putamen very hard.

Queensland. Desert of the Suttor and Burdekin, *F. Mueller*.

N. S. Wales. Arbuthnot's Range, *Fraser*; near the Gwydir river, *Mitchell* (figured in Mitch. Three Exped. i. 82, without any name); Darling Desert, *Victorian Expedition*; Castlereagh river, *Herb. F. Mueller*.

2. ***O. vernicosa*, F. Muell.** *Fragm.* iii. 15. Quite glabrous. Branches thick, marked with the broad scars of the fallen leaves, the young shoots glutinous. Leaves larger than in *O. acidula*, the common petiole slightly flattened; leaflets 15 to nearly 30, lanceolate, acuminate, often above 2 in. long, oblique, with a prominent midrib and transverse reticulations. Panicles 3 or 4 in. long, with divaricate branches and numerous flowers, much smaller than in *O. acidula*. Sepals about $\frac{1}{2}$ line long, slightly ciliate. Petals little more than 1 line. Staminal tube short, with 10 subulate teeth. Fruit the size of that of *O. acidula*, the stony endocarp thicker and harder, usually 3-celled.

N. Australia. Cambridge Gulf, *A. Cunningham*; mouth of the Victoria river, *F. Mueller*.

Var. (?) *pubescens*. Young shoots and inflorescence softly pubescent; flowers still smaller and more numerous.—Mouth of the Victoria river, *F. Mueller* (*lb. F. Muell.*).

3. ***O. venosa*, *F. Muell.* in *Hook. Kew Journ.* ix. 304.** A tall arborescent shrub, quite glabrous, the young shoots slightly glutinous. Leaflets 6 or 8, obliquely oblong or ovate-lanceolate, obtuse or emarginate, 2 to 3 or rarely 4 in. long, coriaceous, prominently pinninerved, slightly reticulate underneath, the petiole angular or sometimes broadly winged. Panicles narrow, 3 to 5 in. long, glabrous. Flowers not yet open in our specimen, but apparently like those of *O. acidula*, except that the staminal tube is exceedingly short, but possibly it may grow out as the bud advances. Sepals orbicular, about 1 line diameter.

Queensland. Between the Dawson and Burnett rivers, *F. Mueller*; Rockhampton, *Thozet*.

4? ***O. cerasifera*, *F. Muell.* in *Hook. Kew Journ.* ix. 305.** A small tree. Leaflets 6 to 10, obliquely oval-oblong, obtuse, $1\frac{1}{2}$ to 3 in. long, narrowed into a very short petiolule, glabrous above, pubescent underneath as well as the common petiole. Flowers not seen. Drupe globular, 1 to $1\frac{1}{2}$ in. diameter, black, with a red sarcocarp. Putamen hard, rugose outside, 12-celled, with 1 seed in each cell.

Queensland. Burdekin river, *F. Mueller*. Until the flowers have been seen, this species must remain in some measure doubtful.

5. ***O. reticulata*, *F. Muell.* in *Hook. Kew Journ.* ix. 305.** A small tree, quite glabrous. Leaves often above a foot long, the common petiole angular or slightly dilated, terminating in a short point. Leaflets 4, 6, or 8, sessile, ovate or broadly ovate-lanceolate, obtuse, 4 to 8 in. long, oblique at the base, coriaceous, smooth above, with very prominent pinnate veins and numerous raised reticulations underneath. Panicles loose, very divaricate, the branches often 6 in. long or more. Flowers sessile, clustered. Sepals above 1 line long, orbicular. Petals twice as long. Staminal tube often divided to near the middle into 10 flat 2-lobed teeth or lobes. Ovary 2- or 3-celled. Fruit $1\frac{1}{2}$ in. diameter, the epicarp fleshy but not thick. Putamen hard and very rugose.—*O. xerocarpa*, *F. Muell.* *Fragm.* iii. 13.

N. Australia. Near Nichol Bay, *Walcott*; islands of the Gulf of Carpentaria, *R. Brown*, *F. Mueller*, *Henne*.

8. CARAPA, Aubl.

(*Xylocarpus*, *Koen.*)

Calyx small, 4- or 5-lobed. Petals 4 or 5, free, imbricate in the bud. Staminal tube urceolate, erenate or lobed; anthers 8 or 10, within the summit. Disk thick, surrounding the ovary. Ovary 4- to 5-celled, with 2 to 6 ovules in each cell; style short, with a large disk-like stigma. Capsule globular or ovoid, fleshy or woody, the dissepiments often disappearing. Seeds several in a compact mass round the remains of the central axis, large, thick, with a ventral hilum; testa spongy; cotyledons superposed, often united; radicle dorsal.—Maritime trees. Leaves pinnate with entire leaflets. Panicles axillary.

The species are few, ranging over the tropical seacoasts either of America and Africa or of Africa and Asia. The Australian one belongs to the latter category.

1. **C. moluccensis**, Lam. ; DC. Prod. i. 626. A tree, glabrous in all its parts. Leaflets 4, rarely 2 or 6, opposite, ovate, obtuse, shortly acuminate or rarely acute, 2 to 3 or rarely 4 in. long, somewhat coriaceous, more reticulate than in any of the preceding genera. Panicles short, loose, and few-flowered, sometimes reduced to simple racemes or with few divaricate branches. Calyx small, irregularly lobed. Petals 4 or rarely 5, $2\frac{1}{2}$ to 3 lines long. Staminal tube crenate or splitting into short lobes. Ovary very small, in the centre of a large thick depressed disk. Ovules 2, 3, or 4 in each cell, excessively minute. Fruit often 3 or 4 in. diameter, irregularly globular. Seeds usually 4 to 6, large, irregularly shaped, closely packed ; testa very thick, of a hard spongy consistence.—*Xylocarpus Granatum*, Koen. ; Willd. Spec. Pl. ii. 328.

N. Australia. Saltwater Creek, near Macadam Range, F. Mueller ; islands of the Gulf of Carpentaria, Henne.

Queensland. N.E. coast, A. Cunningham ; islands of Howick's group, F. Mueller ; Port Denison, Fitzalan (in leaf only, with loose fruits).

Common on the seacoasts of tropical Asia, extending westward to E. Africa and eastward to the Moluccas. It varies considerably in the more compact or looser inflorescence, in the size of the flowers, and in the teeth of the staminal tube.

TRIBE III. CEDRELEÆ.—Stamens free. Ovules more than 2 in each cell. Seeds winged. Leaves pinnate or rarely simple.

9. CEDRELA, Linn.

Calyx small, 5-cleft. Petals 5, imbricate. Disk thick or raised. Stamens 4 to 6, inserted on the summit of the disk, alternating sometimes with as many staminodia, filaments subulate, anthers versatile. Ovary 5-celled, style filiform, with a disk-like stigma ; ovules 8 to 12 in each cell, in 2 rows. Capsule membranous or coriaceous, 5-celled, opening in 5 valves, leaving the dissepiments attached to the persistent axis. Seeds flattened, winged ; albumen scanty ; cotyledons flat ; radicle short, superior.—Tall trees, with coloured wood. Leaves pinnate. Flowers small, in large panicles.

The genus is spread over tropical America and Asia. The Australian species is a common Asiatic one.

1. **C. Toona**, Roxb. Pl. Corom. iii. 33, t. 238. A tall, handsome tree, quite glabrous or the young shoots minutely pubescent. Leaves large, deciduous ; leaflets 11 to 17, opposite or irregularly alternate, ovate-lanceolate, acuminate, 3 to 5 in. long, oblique at the base, petiolulate, membranous. Panicles large, pyramidal, many-flowered, glabrous. Pedicels short. Sepals orbicular, ciliate, very small. Petals nearly 3 lines long. Stamens 5, as long as the petals, inserted in cavities on the outside of the very thick pubescent disk. Ovary half immersed in the disk. Capsule glabrous, oblong, 1 to $1\frac{1}{2}$ in. long.—Wight, Ic. t. 161 ; *C. australis*, F. Muell. Fragm. i. 4.

Queensland. Moreton Bay, Herb. F. Mueller ; Mackenzie's Station, Leichhardt.

N. S. Wales. Illawarra, Herb. F. Mueller, "Red Cedar" of the colonists.

Var. *parviflora*. Petals scarcely 2 lines long.—Clarence river, Wileox.

10. FLINDERSIA, R. Br.

(Oxleya, A. Cunn.; Strzeleckia, F. Muell.)

Calyx small, 5-lobed. Petals 5, imbricate in the bud, spreading. Disk broad, concave. Stamens 5, inserted on the outside of the disk, with as many or fewer staminodia alternating with them, sometimes wanting; filaments subulate; anthers versatile. Ovary 5-celled, 5-lobed; style short, thick, inserted between the lobes; stigma capitate; ovules 4 to 6 in each cell. Capsule oblong, hard, tuberculate or muricate, opening septically in 5 boat-shaped valves or cocci, without any persistent axis. Seeds flat, winged, 2 or 3 on each side of a flat placenta, which almost divides each cell into two; albumen none; cotyledons flat, radicle very short.—Trees. Leaves alternate or more frequently opposite, pinnate or rarely simple, marked with pellucid dots. Flowers in terminal panicles.

The species are all endemic in Australia. The genus, although allied to *Cedrela* and therefore placed by common consent in *Meliaceae*, is nevertheless, as observed by R. Brown very closely connected with *Rutaceae-Zanthoxyleae*, and might be very well placed there next to *Geijera*, with which it is connected, especially through *F. maculosa*.

Leaves alternate (on different branches from the flowers). Petals tomentose outside. Seeds winged at one end only 1. *F. australis*.

Leaves opposite (on the flowering branches). Petals glabrous outside or nearly so.

Leaflets mostly 3 to 6 pairs, very oblique, slightly coriaceous.

Leaflets almost sessile, broad at the base. Petals slightly hairy inside 2. *F. Schottiana*.

Leaflets narrowed into a distinct petiolule. Petals quite glabrous.

Seeds winged at both ends 3. *F. Oxleyana*.

Leaflets 3 or 5, short, oblique, very coriaceous. Seeds winged at one end only 4. *F. Bennettiana*.

Leaves simple or leaflets 3 to 5, narrow, with the petiole broadly winged. Fruit small. Seeds winged at both ends 5. *F. maculosa*.

1. ***F. australis***, R. Br. in *Flind. Voy.* ii. 595, t. 1. A tree of moderate size, with a rugged bark. Leaves alternate, crowded at the end of short barren branches, glabrous; leaflets 3 to 6, broadly lanceolate or oblong-elliptical, obtuse or scarcely acuminate, 2 to 4 in. long, scarcely oblique. Panicles much branched, terminating short branches without any leaves except a few scale-like bracts, sprinkled with a stellate tomentum. Flowers numerous. Calyx open, tomentose, with 5 short broad obtuse lobes. Petals about 2 lines long, tomentose outside, except a narrow border, slightly pubescent inside. Fruit almost woody, 2 or 3 in. long. Seeds (according to the plate quoted) winged at the upper end only.

Queensland. Scrub near Upper Head, Broad Sound, R. Brown (Hb. R. Br.).

2. ***F. Schottiana***, F. Muell. *Fragm.* iii. 25. A tree of moderate size, or sometimes tall. Leaves opposite, crowded under the panicle; leaflets 8 to 12, with or without a terminal odd one, ovate-lanceolate, obtuse or acuminate, 4 to 5 in. long, more or less lanceolate, sessile, with a broad very oblique base, somewhat coriaceous, glabrous on both sides or softly pubescent underneath when young. Panicles ample and many-flowered, but not exceeding the leaves.



Petals about 2 lines long, glabrous outside, sprinkled on the inside as well as the anthers with a few hairs. Fruit not seen.

Queensland. Wide Bay, *Bidwill*; Cumberland Islands, *Herb. F. Mueller*; Brisbane river, *A. Cunningham*.

N. S. Wales. Hastings river, *Thozet*; Clarence river, *Beckler*.

3. F. Oxleyana, *F. Muell. Fragm.* i. 65; iii. 25. A tall, much-branched tree, attaining often 100 ft. Leaves opposite, crowded under the panicles; leaflets 4 to 10, with or without a terminal odd one, broadly lanceolate, obtuse or shortly acuminate, 2 to 4 in. long, oblique and almost falcate, narrowed into a distinct petiolule, glabrous or sprinkled underneath with minute stellate hairs, thinly coriaceous, rather sparingly glandular-dotted. Panicles loose and many-flowered, but shorter than the leaves. Sepals very small. Petals about 2 lines long, obovate-oblong, glabrous or nearly so. Fruit woody, 3 to 4 in. long, muricate. Seeds winged at both ends. *Oxleya xanthoxylla*, *A. Cunn.* in *Hook. Bot. Misc.* i. 246, t. 54.

Queensland. Brisbane river, *Fraser*; *A. Cunningham*, *F. Mueller*. "Yellow Wood" of the colonists.

4. F. Bennetiana, *F. Muell. Herb.* A large tree. Leaves opposite, crowded under the panicles; leaflets 3 or 5, from ovate to ovate-lanceolate or oblong-elliptical, obtuse or scarcely acuminate, 2 to 3 in. long in some specimens, 4 to 5 in. in others, glabrous, very coriaceous, not oblique, and scarcely petiolulate, the common petiole angular. Panicles ample, sometimes short, sometimes exceeding the leaves, minutely stellate-pubescent. Petals about 2 lines long, rather broader than in *F. Oxleyana*, glabrous or nearly so. Fruit 2 or 3 in. long, muricate. Seeds winged at the upper end only, or some with a very small wing also at the lower end, but only seen in one capsule.—*F. australis*, *F. Muell. Fragm.* iii. 26, not of *R. Brown*.

Queensland. Wide Bay, *Bidwill*; Brisbane river, Moreton Bay, *A. Cunningham*, *Fraser*, *W. Hill*.

N. S. Wales. Clarence river, *Beckler*.

5. F. maculosa, *F. Muell. in Journ. Pharm. Soc. Vict.* ii. 44. A small tree, the trunk remarkably spotted by the falling off of the outer bark in patches. Leaves opposite or nearly so, glabrous, coriaceous, the glandular dots often only visible on the young ones, in some specimens all simple, linear-oblong or lanceolate, obtuse or emarginate and mucronate, 1 to 2 in. long or rather more; in other specimens a few of the leaves break out into 2 or 3 narrow continuous lobes, in others, again, all are pinnate, with 3 or 5 leaflets, like the simple leaves, but smaller, and a winged common petiole. Panicles terminal, rather dense, usually shorter than the leaves. Sepals scarcely 1 line long. Petals about 2 lines long, glabrous. Capsule oblong and muricate, like those of the other species, but much smaller, often not more than 1 in. long when fully ripe. Seeds winged at both ends and along the back.—*Elaeodendron maculatum*, *Lindl. in Mitch. Trop. Austr.* 384; *Strzeleckya dissosperma*, *F. Muell. in Hook. Kew Journ.* ix. 308; *Flindersia Strzeleckiana*, *F. Muell. Fragm.* i. 65.

Queensland. Scrub on the Burdekin and Burnett rivers, *F. Mueller*; St. George's Bridge on the Balonne river, *Mitchell*; Port Bowen and Broad Sound, *Herb. F. Mueller*. "Spotted Tree" of the colonists.

N. S. Wales. Between the Darling and Lachlan rivers, *Victorian Expedition*.

The simple-leaved specimens which are the most frequent in N. S. Wales have much the habit of *Geijera*, to which in fact the genus is very nearly allied; the pinnate-leaved specimens are chiefly tropical, but not exclusively so.

ORDER XXXII. OLACINEÆ.

Flowers regular, hermaphrodite or rarely unisexual. Calyx small, 4- or 5-, rarely 6-toothed, free or adnate to the disk (in *Cansjera* scarcely distinguishable from the corolla). Petals 4, 5, or rarely 6, free or united in a campanulate or tubular corolla, valvate in the bud (except *Villaresia*). Stamens as many or twice as many as petals or rarely fewer, adnate to the base of the petals, or free and hypogynous; anthers 2-celled, versatile, or rarely adnate. Disk free, or adnate to the ovary or to the calyx, or divided into scale-like glands. Ovary free or immersed in the disk, 1-celled or imperfectly 2- or 3-celled; style simple; stigma entire or lobed. Ovules 2, 3, or rarely 1, pendulous from a central placenta into the imperfect cells, or from the side or apex of the cavity. Fruit usually an indehiscent drupe, either superior or inferior by the growth over it of the disk and tube of the calyx. Seed solitary, pendulous, or sometimes, owing to the adnate nerve-like remains of the placenta, apparently erect; testa very thinly membranous; embryo very small in the apex of a fleshy albumen, or larger and axile; or, in a genus not Australian, occupying the whole seed without albumen; cotyledons flat or terete; radicle superior. Trees, shrubs, or climbers. Leaves usually alternate, entire, pinnerved, without stipules. Flowers few and axillary, or rarely in terminal panicles, usually small.

The Order is widely dispersed over the tropical and subtropical regions of the globe. The six Australian genera are none of them endemic, one extending to New Zealand, one to tropical Asia, two to tropical Asia and Africa, one to tropical Asia and America, and one is common to Asia, Africa, and America. The Order is more nearly allied to *Loranthaceæ* among *Culicifloræ*, and especially to *Santalaceæ* among *Moschomycideæ*, than to any (except *Ilicinæ*) of the *Discifloræ*, amongst which it is technically placed.

TRIBE I. Olacææ. Stamens twice as many as petals or fewer, or if the same number as petals, opposite to them. Ovary often 2- or 3-celled at the base, 1-celled at least at the top; placenta central, with 2 or 3 pendulous ovules.

Calyx not enlarged after flowering. Stamens twice as many as petals; anthers oblong or linear

1. XIMENTA.

Calyx enlarged and enclosing the fruit. Stamens 3; staminodia (in the Australian species) 5; anthers short

2. OLAX.

TRIBE II. Opiliææ. Stamens as many as petals and opposite to them. Ovary 1-celled, with 1 ovule.

Perianth apparently simple, shortly 4-lobed. Stamens 4, included, alternating with 4 glands or scales

3. CANSJERA.

Calyx minute. Petals 5, free. Stamens 5, exserted, alternating with 5 scales.

4. OPILLA.

TRIBE III. Icacinææ.—Stamens as many as petals and alternate with them. Ovary 1-celled, with 1 or 2 pendulous ovules.

Petals strictly valvate. Ovule 1, the placenta not prominent. Flowers in a much-branched corymbose panicle

5. PENNANTIA.



Petals slightly imbricate. Ovules 2, the placenta forming a half-dissepiment on one side of the cavity. Flowers in a narrow raceme-like panicle 6. VILLARESIA.

TRIBE I. OLACEÆ.—Stamens twice as many as petals or fewer, or if the same number as petals, opposite to them. Ovary often 2- or 3-celled at the base, 1-celled at least at the top; placenta central, with 2 or 3 pendulous ovules.

1. XIMENIA, Linn.

Calyx minutely 4- or 5-toothed, not enlarged after flowering. Petals 4 or 5, bearded inside, valvate in the bud. Stamens twice as many as petals, free; filaments filiform; anthers linear, erect. Ovary 3-celled at the base; stigma capitate; ovules 3, descending into the incomplete cells from a central placenta. Drupe ovoid or globular, with a thick sarcocarp. Seed spuriously erect; embryo minute.—Shrubs or trees, often thorny. Flowers white, rather large for the Order, in small axillary cymes or solitary.

The Australian species is spread over almost all tropical countries, the few other species are American or African.

1. **X. americana**, Linn.; DC. Prod. i. 533. A glabrous shrub, or sometimes a small tree, with spreading branches, often armed with axillary spines (abortive peduncles). Leaves petiolate, ovate, obtuse, or scarcely acute, 1 to 2 in. long, entire, the veins inconspicuous, except the midrib. Peduncles short, bearing little cymes of 3 to 7 yellowish sweet-scented flowers, rarely reduced to a single one. Petals 3 to 4 lines long, densely bearded inside with long white hairs. Drupe attaining 1 in. diameter or rather more. —*X. elliptica*, Forst.; Labill. Sert. Austr. Caled. 34, t. 37; *X. laurina*, Delile, in Ann. Sc. Nat. ser. 2, xx. 89; *X. exarmata*, F. Muell. in Trans. Phil. Inst. Vict. iii. 22.

N. Australia. Ranges of the Suttor and Mackenzie rivers, F. Mueller. The species is widely spread over the tropical regions of both the New and the Old World, varying in most places with or without thorns. The Pacific and New Caledonian *X. elliptica* has been distinguished from the common form as having a globular, not elliptical fruit, but some of Gardner's specimens from Brazil have certainly also the fruit globular. F. Mueller's Australian specimens, like the majority of those in our herbaria, are without fruit; they are unarmed, or have only small nascent spines in the axils of some of the young leaves.

2. OLAX, Linn.

(*Spermaxyrum*, Labill.)

Calyx small, cup-shaped, truncate, enlarged after flowering and enclosing the fruit. Petals 5 or 6, free, or slightly cohering, valvate in the bud. Stamens usually 3, alternate with the petals, the filaments adnate to the petals and connecting them in pairs; staminodia as many as petals and opposite to them, filiform or flat, entire or 2-cleft. Ovary free, 1-celled, or very shortly 3-celled at the base; stigma entire or slightly 3-lobed; ovules 3, pendulous from a central placenta. Drupe globular or oblong, enclosed in the enlarged calyx, but free from it, the sarcocarp thin. Seed spuriously erect; embryo very small in the apex of a fleshy albumen.—Trees, shrubs, or undershrubs, rarely half climbing, the Australian species all erect shrubs, with small alter-

nate, entire, distichous leaves, the veins inconspicuous, except the midrib. Flowers axillary, solitary in the Australian species, several in short racemes or spikes in some others.

The genus is confined to the Old World, extending over tropical Asia and Africa. The Australian species are all endemic, and differ from all except the E. Indian *O. nana*, Wall., in their solitary axillary flowers and small leaves. They have all 5 petals, 3 stamens, and 5 staminodia.

Staminodia undivided.

Leaves oval or broadly oblong, retuse. Flowers glabrous inside.	1. <i>O. phyllanthi</i> .
Staminodia subulate	2. <i>O. retusa</i> .
Leaves narrow-oblong, mucronate. Staminodia linear, bearded at the base	3. <i>O. stricta</i> .
Leaves reduced to minute scales. Flowers densely bearded inside.	4. <i>O. Benthamiana</i> .
Staminodia linear	5. <i>O. aphylla</i> .
Staminodia 2-cleft to the middle.	
Leaves rather thin, narrow, retuse (Eastern species)	
Leaves rather thick, from linear to obovate or obcordate (Western species)	

1. ***O. phyllanthi***, *R. Br. Prod.* 358. A shrub of 4 or 5 ft., the leafy branches, when dry, having much the aspect of those of a *Phyllanthus*. Leaves oval or broadly oblong, truncate or emarginate, from $\frac{1}{3}$ to 1 in. long, sessile, with a broad base, thin, glabrous, and somewhat glaucous. Pedicels very short, slender. Petals nearly $1\frac{1}{2}$ lines long, glabrous. Filaments flattened below the middle; staminodia glabrous, undivided, subulate, shorter than in the other species. Fruit ovoid-globular, about 2 lines long.—*Spermaryrum phyllanthi*, Labill. *Pl. Nov. Holl.* ii. 84, t. 233 (the figure incorrect as to the shape of the petals and anthers); *Lopadocalyx phyllanthoides*, Klotzsch, in *Pl. Preiss.* i. 178, corrected to *O. phyllanthi*, *J. c. ii.* 230.

W. Australia. King George's Sound, *Labillardière*, *R. Brown*, and others; rocky places near Albany, *Preiss.* n. 1211.

2. ***O. retusa***, *F. Muell. Herb.* (as a var. of *O. stricta*). A glabrous shrub, with the slender virgate branches of *O. stricta*. Leaves linear-cuneate or narrow-oblong, truncate and emarginate, or almost 2-lobed, minutely mucronate, rarely exceeding $\frac{1}{2}$ in. and smaller on the lateral branches, rounded at the base. Pedicels very short. Flowers about 2 lines long. Filaments glabrous, dilated at the base; staminodia bearded below the middle, glabrous above and divided into 2 linear lobes. Fruit ovoid-oblong, not exceeding 3 lines in the specimens seen.

Queensland. Moreton Island, *M'Gillivray*, *F. Mueller*. This is believed by F. Mueller to be a variety of *O. stricta*; but besides the shape of the leaves, which is nearer to that of *O. phyllanthi*, I have found, in the few flowers I have been able to examine, the staminodia always 2-cleft, as in *O. Benthamiana* and in the Indian species.

3. ***O. stricta***, *R. Br. Prod.* 358. An erect, glabrous shrub, of 2 or 3 ft., with slender virgate branches. Leaves narrow-oblong or linear, acute or obtuse, but always mucronate, $\frac{1}{4}$ to $\frac{1}{2}$ in. or rarely $\frac{3}{4}$ in. long, flat, with a prominent midrib, narrowed or rarely rounded at the base. Pedicels scarcely 1 line long. Petals varying from 2 to 3 lines. Filaments flattened to very near the anthers, glabrous; staminodia linear, entire, more or less bearded below the middle. Fruit obovoid-oblong, often 4 lines long or rather more.

Queensland. Edges of lagoons, Moreton Island, *F. Mueller*.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 139, and others; Blue Mountains, *Miss Atkinson*; Port Macquarie, *Backhouse*; barren brushes, N.W. interior, *Fraser*.

4. O. Benthamiana, *Miq.* in *Pl. Preiss.* i. 228. A glabrous shrub of about 2 ft., usually much-branched and more rigid than *O. stricta*, and not drying so black. Leaves in the ordinary form linear or narrow-oblong in the lower part of the branches, about $\frac{1}{2}$ in. long, terminating in a recurved point, narrowed at the base, rather thick, convex underneath, with the midrib less prominent than in the preceding species, the upper leaves, especially the floral ones, passing into a short broadly obovate form; in a few luxuriant specimens, all the leaves are obovate-oblong, 1 in. long or rather more; in others, all are broadly obovate, cuneate, or obocordate, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, and not mucronate. Flowers 2 to 3 lines long as in *O. stricta*, but the staminodia are pubescent only, or slightly bearded, and divided to the middle into 2 linear, oblong, or spatulate lobes, nearly as long as the petals. Fruit globular, attaining 4 or 5 lines diameter.

N. Australia. Bay of Rest, N.W. coast, *A. Cunningham*. (A single specimen with small obovate leaves.)

S. Australia. Port Lincoln, *Wilhelmi*. (Specimens with obovate leaves, not seen in flower and therefore doubtful, although precisely resembling some W. Australian ones.)

W. Australia. Swan River, *Drummond*, *Preiss*, *n.* 2035, *O. stricta*, etc. (leaves mostly narrow and pointed); Marchison river, *Oldfield* (leaves all obovate or oblong), Gardner and Kalgan rivers, *Oldfield* (leaves cuneate, emarginate, or obocordate); Swan River, *Drummond*, *n.* 729 (leaves, especially the floral ones, small and broad, flowers small, the lobes of the staminodia oblong-spatulate and petaloid).

Lopadocalyx uliginosus, Kl. in *Pl. Preiss.* i. 178, corrected to *Olax uliginosa*, Kl. l.c. ii. 230, from swampy places in the plains between Mounts McIville and Elphinstone, *Preiss*, *n.* 1210, which I have not seen, would appear, from the very imperfect description given, to be the ordinary narrow-leaved form of *O. Benthamiana*.

5. O. aphylla, *R. Br. Prod.* 358. A shrub of several feet, with numerous, wiry, virgate, slightly pubescent branches. Leaves all reduced to minute scales. Flowers very small, almost sessile in the axils of orbicular ciliate bracts rather longer than the calyx, towards the ends of the branches. Petals scarcely more than 1 line long, densely bearded inside about the middle. Staminodia linear and entire, or slightly spatulate and emarginate at the top. Fruit ovoid, about 2 lines long.

N. Australia. N. coast, *R. Brown*; barren stony ridges on the Fitzmaurice river, *F. Mueller*; Arnhem's Land, *Leichhardt*.

TRIBE II. OPILIEÆ.—Stamens as many as petals or corolla-lobes and opposite to them, usually alternating with as many hypogynous glands or scales. Ovary 1-celled, with a single ovule, erect or suspended from an erect central placenta. Seed spuriously or sometimes perhaps really erect; radicle superior.

3. CANSJERA, Juss.

Perianth apparently simple, the calyx very minute and often not distinguishable, at the base of the tubular or urceolate 4-lobed corolla. Stamens 4, opposite to the petals or corolla-lobes, and more or less adherent at the base; filaments filiform; anthers small. Hypogynous scales (or lobes of the disk) 4, alternating with the stamens. Ovary small, fleshy; ovule 1, apparently

erect or suspended from a short placenta in the centre of the minute cavity. Drupe with a thin sarcocarp. Seed erect; embryo small or sometimes elongated.—Weak or climbing shrubs. Leaves alternate, entire. Flowers small, in short axillary spikes.

Besides the Australian species, which is also in New Ireland, the genus comprises 2 or perhaps 3 from tropical Asia.

1. **C. leptostachya**, *Beauh. in Hook. Lond. Journ.* ii. 231. A climbing shrub, glabrous or the young shoots very minutely tomentose. Leaves ovate-lanceolate, long-acuminate, 2 to 3 in. long, membranous, glabrous. Spikes 1 or 2 together in the axils, rarely exceeding $\frac{1}{2}$ in. Flowers in the young bud strigose-pubescent, sessile in the axils of narrow minute bracts which soon fall off, when fully open about 1 line long, nearly globular and glabrous, the lobes very short and spreading. Filaments slender, but shorter than the perianth. Hypogynous scales short, broad, entire or rarely 3-toothed. Fruit not seen.—Meisn. in DC. *Prod.* xiv. 519.

Queensland. Cape York and islands off the N.E. coast, *A. Cunningham*, *McGillivray*. The species is also in New Ireland. The flowers are about half the size of those of the common *C. Rheedii*, Gmel., and I have not succeeded in detaching the calyx from the corolla, as I have readily done in Malacca specimens of *C. Rheedii* or of an allied species.

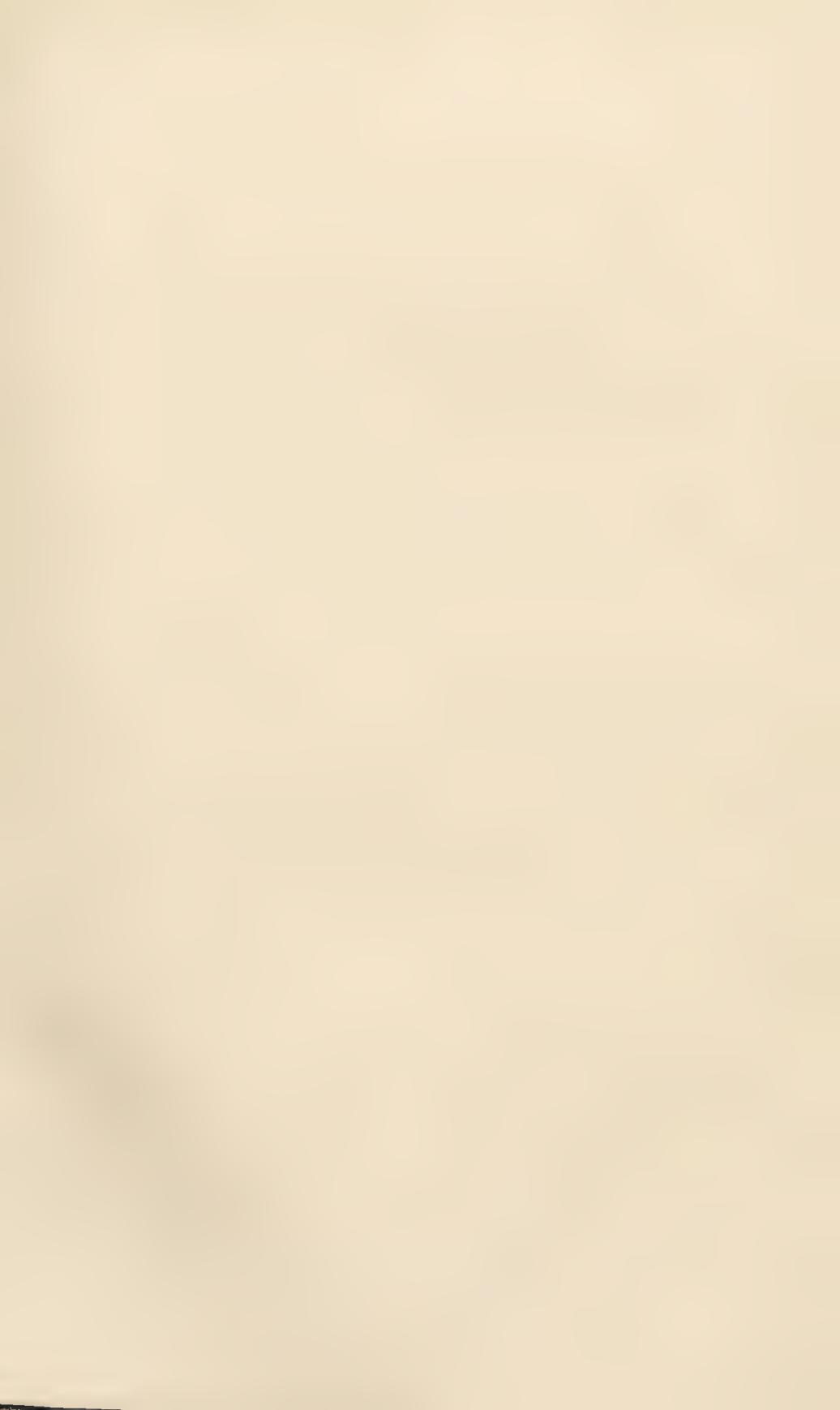
4. **OPILIA**, Roxb.

Calyx minute, 5- or rarely 4-toothed. Petals 5, rarely 4, hypogynous, valvate in the bud. Stamens as many, alternating with the petals, free; filaments filiform; anthers ovate. Disk of 5, rarely 4 scales, alternating with the stamens. Ovary 1-celled, tapering into a short thick truncate style; ovule solitary, suspended from a central filiform placenta very early adnate to it. Drupe with a thin sarcocarp and crustaceous endocarp. Seed spuriously erect; embryo linear, short, or nearly as long as the albumen.—Shrubs or small trees, sometimes climbing. Leaves alternate, entire. Flowers in axillary racemes; pedicels 3 together in the axils of peltate bracts, which are imbricate at an early stage but fall off before the flowers expand.

A genus of 2 or perhaps 3 species, natives of tropical Asia and Africa, the Australian species one of the widest dispersed.

1. **O. amentacea**, Roxb. *Pl. Corom.* ii. 31, t. 158. A scrambling half-climbing shrub or small weak tree, glabrous, or the young leaves and shoots minutely tomentose-pubescent. Leaves petiolate, ovate, ovate-lanceolate, or almost oblong, acute or acuminate, 2 to 3 or even 4 in. long, or rarely shorter and very obtuse, entire, thinly coriaceous, the veins usually prominent though fine. Racemes before flowering resembling little cylindrical cones of $\frac{1}{2}$ in., the peltate imbricate but almost squarrose bracts alone visible, when in flower slender, about 1 in. long, without bracts. Flowers very small, on filiform pedicels of about 1 line. Petals about $\frac{1}{2}$ line long, very deciduous. Drupe ovoid or globular, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Embryo linear, nearly as long as the albumen.—Wight, *Illustr.* t. 40; *O. javanica*, Miq. *Fl. Ind. Bat.* i. part i. 784.

N. Australia. York Sound, N.W. coast, *A. Cunningham*; Victoria river, *Bynoe*, F. Mueller; Port Essington, *Armstrong*; Point Pearce, F. Mueller. Also in the Indian Peninsula, in Ceylon and in Java. *O. pentidis*, Blume, *Mus. Bot.* i. 246, from New Guinea, is also probably, as he himself suggests, the same species. The fruit is on some



Indian specimens globular, as described by Roxburgh. Wight figures it as ovoid, and so it appears to be on Horsfield's Javanese specimens, and certainly on P. Mueller's from Victoria river. All our other specimens from India as well as from Australia are in flower only or with young fruit.

TRIBE III. ICACINEÆ.—Stamens as many as petals or corolla-lobes, and alternate with them. Ovary 1-celled, with 2, rarely 1 ovule, pendulous from one side or the apex of the cavity. Seed pendulous.

5. PENNANTIA, Forst.

Flowers dioecious or polygamous. Calyx minute. Petals 5, hypogynous, glabrous, valvate in the bud. Stamaens 5, alternating with the petals; anthers oblong-sagittate. Ovary 1-celled; stigma nearly sessile, entire or 3-lobed; ovule solitary, suspended from the apex of the cavity. Drupe with a hard putamen, or almost baccate with a slightly coriaceous endocarp. Seed pendulous; embryo small within the apex of the fleshy albumen.—Trees. Leaves thinly coriaceous, entire or (in New Zealand species) coarsely toothed. Flowers in terminal corymbose panicles.

Besides the Australian species, which is endemic, there is one from Norfolk Island and another from New Zealand.

1. *P. Cunninghamii*, Miers, in *Ann. Nat. Hist. ser. 2*, ix. 491, and *Contrib.* 80, t. 12. A glabrous, suberect, tall shrub. Leaves ovate or broadly elliptical, acuminate, 4 to 6 in. long, entire, coriaceous and shining when old, narrowed into a petiole of $\frac{1}{2}$ in. or more. Flowers numerous, in broad rather dense panicles, either terminal or in the upper axils, the males only known. Calyx scarcely prominent. Petals nearly $1\frac{1}{2}$ lines long. Filaments bent in below the summit in the bud; anthers oblong, sagittate. Rudimentary ovary narrow, with 2 or 3 erect style-like lobes, and occasionally containing an imperfect pendulous ovule. Drupes or berries ovoid, about $\frac{1}{2}$ in. long, the endocarp scarcely hardened. Seed pendulous; testa thinly membranous; embryo much shorter than the albumen.

2. *S. Wales*. Illawarra district, A. Cunningham, McArthur, Shepherd; Kiama, Harvey; Clarence river, Moore. The ovaries described by Miers appear to me to have been imperfect, at least I find none but male flowers in the specimen he examined, nor in any others I have seen. It is probable that the female flowers, as in the New Zealand species, are smaller, and have therefore not attracted the notice of collectors.

6. VILLARESIA, Ruiz and Pav.

(*Pleuropetalum*, Blume; *Chariessa*, Miq.)

Flowers hermaphrodite or polygamous. Sepals 5, distinct, broad, imbricate. Petals 5, with the midrib prominent inside, imbricate or almost valvate in the bud. Stamaens 5, alternating with the petals; anthers cordate. Ovary 1-celled, the cavity marked on one side with a raised ridge half dividing it; style short, thick; ovules 2, suspended from the summit of the raised ridge. Drupe ovoid or globular, the endocarp forming a prominent half-dissepiment which penetrates into a deep vertical furrow in the seed. Embryo small, in the apex of the albumen.—Lofty trees (or tall woody climbers?). Leaves

alternate, coriaceous, entire or toothed. Flowers in small cymes, along the simple rhachis of a raceme-like panicle.

Besides the Australian species, which may be endemic, there is one (perhaps not really different) from the Indian Archipelago, one from the S. Pacific islands, and several from S. America. The genus is exceptional in *Olacineæ* by the more or less imbricate petals. I have not seen the 2 cells to the ovary which Miers met with in one species, possibly in accidentally abnormal flowers.

1. **V. Moorei**, F. Muell. *Herb.* A lofty handsome tree, glabrous except the inflorescence. Leaves ovate-lanceolate or oblong, acuminate, 3 to 4 in. long, entire, narrowed into a short petiole, coriaceous and shining, but not so thick as in the American species. Raceme-like panicles irregularly lateral or axillary, 2 to 4 in. long, hoary with a minute pubescence. Cymes numerous, few-flowered, on short peduncles along the rhachis. Flowers almost sessile in the cymes, those seen all males. Petals 1 line long, very slightly imbricate. Drupes globular, the putamen hard, about $\frac{1}{2}$ in. diameter, rugose outside, the half-dissepiment projecting quite to the centre of the cavity and there slightly thickened, forming a column, up the centre of which the placenta appears to pass, as if the endocarp had grown over it as in the New Zealand *Pennantia*. Seed quite enclosing the half-dissepiment, its transverse section being horseshoe-shaped.

N. S. Wales. Clarence river, Moore. The Javanese *V. suaveolens* (*Pleuropeltatum suaveolens*, Blume) is unknown to me, but must, from the character given, be nearly allied to this species. *V. samoensis* (*Pleuropeltatum samoense*, A. Gr.) which we have also from the Fiji islands, appears to be quite distinct.

ORDER XXXIII. ILICINEÆ.

Flowers regular, hermaphrodite or unisexual. Calyx of 4 or 5, rarely 3 or more than 5 sepals, imbricate, usually persistent. Petals 4 or 5 or rarely more, hypogynous, imbricate in the bud, sometimes united in a lobed corolla. Stamens of the same number as petals, hypogynous, free or adhering to the corolla at the base; anthers 2-celled, opening inwards. Disk none, except the thickened base of the ovary. Ovary free, 3- to 5-celled, rarely many-celled; stigma broad or capitate, sessile or supported on a distinct style. Ovules 1 or 2 in each cell, pendulous, with a superior micropyle. Fruit a drupe, with as many one-seeded pyrenes as cells. Seeds pendulous; testa membranous; embryo very small in the apex of a fleshy albumen.—Trees or shrubs. Leaves alternate, simple, without stipules. Flowers small, in axillary umbels or cymes, rarely solitary or terminal. Fruits small.

The Order, limited to the large genus *Ilex*, and two small ones separated from it, is dispersed over the greater part of the world, but most abundant in America, very rare however in Africa, absent from New Zealand, and represented by one species only in Australia.

1. **BYRONIA**, Endl.

Petals and stamens 5 or more. Ovary-cells and pyrenes of the fruit 10 or more. Other characters and habit those of the Order.

Besides the Australian species, which is endemic, the genus only comprises two others, from the islands of the Pacific.

1. **B. Arnhemensis**, F. Muell. *Fragm.* ii. 119. A shrub or tree, perfectly glabrous. Leaves elliptical, obtuse or obtusely acuminate, 3 to 5 in. long, entire, coriaceous, shining above, narrowed into a petiole of $\frac{1}{4}$ to $\frac{1}{2}$ in. Umbels few-flowered, on axillary or lateral peduncles of about $\frac{1}{2}$ in., sometimes several in a short axillary leafless branch. Flowers not seen. Fruiting pedicels 3 or 4 lines long. Fruit (not quite ripe) small, nearly globular, unlobate, the persistent calyx small, of 5 to 7 sepals. Pyrenes about 12.

N. Australia. Valleys near Providence Hill, Arnhem's Land, F. Mueller.

ORDER XXXIV. CELASTRINEÆ.

Flowers regular, hermaphrodite or polygamous. Calyx small, persistent, 4- or 5-cleft, rarely 3- or 6-cleft. Petals as many as calyx-segments, spreading, imbricate or rarely valvate in the bud. Stamens as many as petals and alternate with them, inserted round the base or on the margin of the disk, or upon the disk itself; filaments usually short, incurved; anthers short, 2-celled, the cells in a few genera confluent into one. Disk usually conspicuous, more or less fleshy, flat or broadly cup-shaped, or thick and conical, nearly free, or adnate to the base of the calyx or confluent with the ovary. Ovary sessile on the disk, 2- to 5-celled, tapering to a short style with an entire or lobed stigma; ovules usually 2 in each cell, ascending with a ventral raphe, occasionally several, rarely 1 only, or pendulous with a dorsal raphe. Fruit a capsule, berry, drupe, or samara, rarely divided into distinct carpels. Seeds usually enveloped in an arillus, sometimes winged; albumen fleshy or almost horny or none; embryo usually rather large, with flat cotyledons and a short radicle next to the hilum.—Trees or shrubs, occasionally thorny, or woody climbers. Leaves opposite or alternate, entire or toothed. Stipules minute and very deciduous or none. Flowers small, white or greenish, in axillary cymes or small racemes or in terminal panicles.

A considerable Order, dispersed over the greater part of the globe, more abundantly within the tropics than in temperate regions. Of the six Australian genera one only is endemic, the others are all Asiatic, one extends to Africa and S. Europe but is not American, one is also tropical American but not hitherto found in Africa, and two are both in America and Africa. The peculiar disk readily characterizes the greater number of genera, where that is wanting the insertion of the ovules and inferior radicle are the chief points separating *Celastrineæ* from *Ilicineæ*; from *Rhamnaceæ*, with which the real affinity is much closer, the stamens alternating with the petals is a constant distinctive mark. The majority of *Celastrineæ* assume also when dry a peculiar pale-green colour, very rare in allied Orders.

TRIBE I. **Celastrææ.**—Stamens the same number as petals, inserted round the disk or on its margin. Seeds albuminous.

Leaves alternate. Ovules 2 in each cell. Capsule loculicidal, coriaceous.

Flowers in racemes or panicles. Stamens on the margin of the disk	1. CELASTRUS.
Flowers in cymes. Stamens under the disk	2. GYMNOPIRIA.
Leaves alternate. Ovules 3 or more in each cell. Capsule loculicidal, woody or bony. Flowers in cymes. Stamens on the margin of the disk	3. DENHAMIA.
Leaves mostly opposite. Ovules 2 in each cell. Drupe indehiscent, 2- or 3-celled	4. ELEODENDRON.

Leaves alternate. Ovules numerous in separate cells. Drupe indehiscent, with numerous pyrenes 5. *SIPHONODON*.
 TRIBE II. **Hippocrateæ**.—Stamens usually 3, with a 5-merous calyx and corolla, inserted on the disk; filaments usually recurved at the top. Albumen none.
 Leaves opposite. Ovules 2 or several in each cell. Carpels distinct, flat, 2-valved. Seeds winged 6. *HIPPOCRATEA*.

TRIBE I. *CELASTREÆ*.—Stamens the same number as petals, inserted round its disk or on its margin, the filaments usually incurved. Seeds albuminous.

1. *CELASTRUS*, Linn.

Flowers polygamous. Calyx 5-cleft. Petals 5, spreading. Disk broad, concave. Stamens 5, inserted on the margin of the disk; filaments subulate, flattened at the base; anthers ovoid or oblong. Ovary not immersed in the disk, 2- to 4-celled; style usually short, the stigma lobed, spreading; ovules 2, collateral, erect, the funicle cup-shaped. Capsule globular oblong or ovoid, coriaceous, 2- to 4-celled, opening loculicidally. Seeds 1 or 2 in each cell, usually enveloped partially or wholly in a fleshy arillus, sometimes connecting the seeds in a mass, sometimes nearly or quite wanting; testa membranous or almost crustaceous; albumen fleshy; cotyledons leafy.—Trees or shrubs, often climbing, unarmed. Leaves alternate, petiolate, entire, or serrate. Stipules minute and deciduous, or none. Flowers small, in terminal or axillary oblong panicles or racemes. Pedicels articulate. Bracts very small.

The genus extends chiefly over tropical and eastern extratropical Asia, with 1 Mascarene and a few N. American species. The Australian species are all endemic, although one is nearly allied to a common Indian one.

Tall climber. Panicles terminal. Ovary 3-celled 1. *C. australis*.
 Trees or tall shrubs. Racemes or pedicels lateral or axillary. Ovary 2-celled.

Leaves ovate or elliptical.

Leaves quite entire, much narrowed into a long petiole.

Flowers 5-merous 2. *C. Muellieri*.

Flowers 4-merous 3. *C. dispermus*.

Leaves entire or toothed, petiole short. Flowers 5-merous 4. *C. bilocularis*.

Leaves linear or narrow-lanceolate, entire 5. *C. Cunninghamii*.

1. ***C. australis***, *Hors. and Muell. in Trans. Phil. Soc. Vict.* i. 41. A tall, woody, glabrous climber. Leaves from ovate-lanceolate to oblong-elliptical or lanceolate, acuminate, 2 to 4 in. long, entire or minutely and usually remotely serrate, narrowed into a petiole of 1 to 3 lines. Panicles terminal, or rarely in the upper axils, narrow, loose, rarely above 2 in. long. Flowers white. Calyx-lobes broad, rounded, ciliate. Petals twice as long, attaining a little more than 1 line, broadly ovate or orbicular. Disk almost free from the calyx. Ovary 3-celled; style short, with 3 spreading stigmatic lobes. Capsule nearly globular, rarely exceeding 3 lines diameter. Seeds enveloped in a fleshy arillus.—Reissek, in *Linnaea*, xxix. 265; F. Muell. *Fragm.* iii. 94.

Queensland. Burnett and Dawson rivers and Moreton Bay, *F. Muell.*

N. S. Wales. Port Jackson, *R. Brown*; northward to Clarence river, *Beckler*,

Wilcox; New England, *C. Stuart*; southward to Illawarra, *A. Cunningham*, *Buckland*, *M'Arthur*.

Victoria. *Moist forests on the Snowy and Buchan rivers, F. Mueller.*

The species differs slightly from the E. Indian *C. paniculatus*, Willd., in the narrower and more acuminate, not obovate leaves, usually more coriaceous, and in the rather smaller flowers and fruits.

2. **C. Muelleri**, *Benth.* Probably a tree, quite glabrous, flowering before the leaves are fully out. Branches apparently weak and slender. Leaves in our specimens still young, elliptical or broadly lanceolate, acutely acuminate, quite entire, narrowed into a rather long petiole. Flowers small, white, in simple lateral racemes of about $\frac{1}{2}$ in., occasionally growing out into leafy branches. Pedicels 1 to 2 lines long, articulate about the middle, thickened under the flower. Calyx-lobes 5, ovate, half as long as the petals. Petals 5, oblong, about $1\frac{1}{2}$ lines long. Disk broad, adnate to the calyx at the base only. Ovary 2-celled, tapering into a very short style, with 2 scarcely prominent stigmatic lobes. Adult leaves and fruits not seen.

N. Australia. Near Macdonald Range, *F. Mueller*. I had at first thought that this might have been the flowering state of *C. dispermus*, but the flowers are constantly 5-merous.

3. **C. dispermus**, *F. Muell.* in *Trans. Phil. Inst. Vict.* iii. 31. A small glabrous tree. Leaves elliptical, obovate-oblong, or rarely broadly lanceolate, obtuse or slightly acuminate, 2 to 3 in. long, quite entire, much narrowed into a rather long petiole. Racemes axillary or lateral, not seen in flower, when in fruit 1 to $1\frac{1}{2}$ in. long, the pedicels 1 to 2 lines. Persistent calyx very small, with 4 triangular lobes. Capsule obovoid or obovate, slightly compressed, 3 to 4 lines long, 2-celled and 2-valved, with usually 2 seeds, covered at the base, according to *F. Mueller*, with a thick arillus, but I find no remains of it on our specimens; very rarely the capsule is 3-angled and 3-celled.

Queensland. Araucaria forests near Moreton Bay, *F. Mueller*; Port Denison, *Tizulan*. Until the flowers have been seen, some doubts must remain as to the affinities of this species.

4. **C. bilocularis**, *F. Muell.* in *Trans. Phil. Inst. Vict.* iii. 31. A small much-branched glabrous tree. Leaves ovate, oblong, or broadly lanceolate, obtuse or slightly acuminate, $1\frac{1}{2}$ to $2\frac{1}{2}$ or very rarely 3 in. long, entire sinuate or bordered by acute teeth, rounded or cuneate at the base, on a short petiole. Racemes axillary or lateral, rarely 1 in. long. Pedicels 1 to 2 lines. Calyx-lobes 5, broad and short. Petals 5, ovate, about 1 line long. Ovary 2-celled; style exceedingly short, with 2 broad short spreading stigmatic lobes. Capsule 2-valved, coriaceous, pear-shaped or nearly globular, under 3 lines diameter. Seeds enclosed in a thin arillus.

Queensland. Dawson and Burnett rivers, *F. Mueller*; Brisbane and Logan rivers, *Fraser* (all with entire or slightly toothed leaves); Warwick, *Beechler* (with sharply toothed leaves).

5. **C. Cunninghamii**, *F. Muell.* in *Trans. Phil. Inst. Vict.* iii. 30. A tall shrub or small tree, quite glabrous and often somewhat glaucous. Leaves linear or narrow-lanceolate, mucronate, 2 to 3 in. long in some specimens, all under 1 in. in others, entire, rigid, the midrib alone prominent underneath.

Flowers small, in short loose axillary or lateral racemes, occasionally growing out into leafy-branches. Pedicels slender, 2 to 3 lines long. Calyx-lobes 5, orbicular, not ciliate. Petals broadly ovate, about 1 line long. Disk rather thick, but less so than in *Gymnosporia*. Ovary 2-celled, with a short style and 2 short spreading stigmatic lobes. Capsule globular or ovoid, 2 lines diameter, or rather more, 2-valved, 1- or 2-seeded. Seeds enclosed in a pulpy arillus.—*Cathia Cunninghamii*, Hook. in Mitch. Trop. Austr. 387.

N. Australia. Victoria river, *P. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Broad Sound, *R. Brown*; Moreton Bay?, *A. Cunningham*; Rockhampton, *Thozet*; Warwick, *Beckler*; St. George's Bridge, *Mitchell*.

N. S. Wales. Port Jackson and Hunter's River, *R. Brown*; Hastings, Clarence, and Macleay rivers, *Beckler*; New England, *C. Stuart*; Blue Mountains, *Miss Atkinson*; Penrith and St. Aubyn's, *Backhouse*; Paramatta, *Woolts*; Lachlan river, *A. Cunningham*.

This and the three preceding species appear to have the erect habit but not the cymose inflorescence nor the thick disk of *Gymnosporia*, and the stamens always proceed from the margin of the disk.

2. GYMNOSPORIA, W. and Arn.

Calyx 4- or 5-cleft. Petals 4 or 5, spreading. Stamens 4 or 5, inserted under the disk; filaments subulate; anthers short. Disk broad, sinuate or lobed. Ovary attached by a broad base or partially immersed in the disk, 2- or 3-celled; style short; stigma 2- or 3-lobed; ovules 2 in each cell. Capsule obovoid or nearly globular, 2- or 3-celled, opening loculicidally. Seeds 1 or 2 in each cell, the arillus complete or imperfect, or sometimes wanting; testa coriaceous; albumen fleshy; cotyledons leafy.—Shrubs or small trees, the small branches often thorny. Leaves alternate, entire or serrate, without stipules. Flowers small, in dichotomous cymes, either axillary or on the old nodes.

The genus is widely diffused over the warmer regions of the Old World, one species being found as far north as Spain, and a few extending to the Pacific islands. The Australian species is an Indian and African one.

1. G. montana, W. and Arn. *Prod.* 159 (under *Celastrus*). A tall glabrous shrub or small tree, the smaller branches occasionally terminating in stout thorns. Leaves obovate, very obtuse, $1\frac{1}{2}$ to $2\frac{1}{2}$ or rarely 3 in. long, entire or minutely crenulate, narrowed into a petiole of 2 or 3 lines, membranous or thinly coriaceous, of a pale-green. Cymes 2 or 3 together in the axils or on the old nodes, rarely above 1 in. long, with slender dichotomous branches. Calyx-lobes 5, very short, broad, ciliate. Petals 5, obovate, about 1 line long. Ovary 3-celled; style very short, with 3 spreading stigmatic lobes. Capsule flat at the top, obtusely 3-angled, about 3 lines diameter in the Australian specimens, usually smaller in India. Arillus of the seeds cup-shaped.—*Celastrus montanus*, Roxb.; W. and Arn. l. c., with all the synonyms quoted; Wight, *IC. Pl.* t. 382.

Queensland. Cape York, *McGillivray*. Common in the Indian Peninsula, and apparently the same as the tropical African *Celastrus senegalensis*, Lam.; I have seen no specimens from the Indian Archipelago. The Australian specimens are unarmed, but that is frequently the case with Indian ones, with which they agree in every respect except the larger capsules.

3. DENHAMIA, Meisn.

(Leucocarpon, A. Rich.)

Calyx 5-cleft. Petals 5. Stamens 5, inserted on the margin of the disk; filaments subulate; anthers ovate. Disk broadly capular, rather thick. Ovary 1-celled, with 3, or rarely 4 or 5 parietal placentas, or completely divided into as many cells; style short, with as many stigmatic lobes as cells or placentas. Ovules 3 to 8 to each cell or placenta. Capsule ovoid or globular, opening in thick woody or bony valves, bearing the placentas or dissepiments in their centre. Seeds enclosed in a fleshy arillus; albumen fleshy; cotyledons flat.—Shrubs or small trees, glabrous and more or less glaucous. Leaves alternate, rigid, entire, or toothed. Flowers small, in few-flowered cymes or racemes.

The genus is exclusively Australian, and, on account of the parietal placentation of two species, has been by some referred to *Bixinaeæ*; but the disk, stamens, general habit, etc., are those peculiarly characteristic of *Celastrinææ*.

Ovary 1-celled; placentas (4- to 8-ovulate) not meeting in the axis.

Veins of the leaves not very prominent.

Flowers racemose. Style distinct	1. <i>D. oleaster</i> .
Flowers in cymes or narrow panicles. Style very short, branched	2. <i>D. obscura</i> .
Ovary 3-celled, placentas (3- or 4-ovulate) united in the axis. Leaves prominently veined	3. <i>D. pittoспорoidес</i> .

1. ***D. oleaster***, F. Muell. in *Trans. Phil. Inst. Vict.* iii. 29. A tall shrub with slender branches. Leaves lanceolate, acute, or rarely obtuse, 2 to 3 in. long, entire or remotely toothed, narrowed into a very short petiole, coriaceous, the veins scarcely conspicuous. Flowers in short, simple, axillary or terminal racemes, the pedicels very rarely bearing 2 flowers. Calyx-segments broadly ovate or orbicular. Petals nearly 2 lines long. Disk thicker, and filaments longer than in the other two species. Ovary 1-celled, tapering into a style of at least $\frac{1}{2}$ line, the stigmatic lobes very short. Placentas 3, with 4 to 6 ovules to each. Fruit not seen.—*Melicytus (?) oleaster*, Lindl. in *Mitch. Trop. Austr.* 383.

Queensland. St. George's Bridge, Balonne river, *Mitchell*.

2. ***D. obscura***, Meisn. in *Walp. Rep.* i. 203. A tall shrub or small tree, the young branches generally pendulous. Leaves mostly oblong-lanceolate, acuminate, 2 to 3 in. long, entire, with often wavy margins, narrowed into a rather long petiole, coriaceous, finely but not prominently veined; on barren branches the leaves are sometimes broadly ovate and bordered by coarse prickly teeth like those of a Holly. Flowers in small pedunculate cymes in the upper axils, or forming a short oblong terminal panicle. Calyx-segments ovate. Petals rather broad, $1\frac{1}{2}$ lines long. Ovary 1-celled, with 3 to 5 placentas; style very short, with 3 to 5 oblong-linear stigmatic branches. Ovules 4 to 8 to each placenta. Capsule ovoid or globular, attaining about 1 in., of a pale-whitish hue when dry, the thick valves bearing slightly projecting placentas along their centre.—*Leucocarpon obscurum*, A. Rich. *Sert. Astrol.* 46, t. 18; *Denhamia xanthosperma*, F. Muell. *Trans. Phil. Inst.* iii. 28, and *D. heterophylla*, F. Muell. l. c. 29.

N. Australia. York Sound, N.W. coast, *A. Cunningham*; Melville Island (not VOL. I.

Moreton Bay), *Fraser*; Victoria river and Arnhem's Land, *P. Mueller*; Port Essington, *Armstrong*.

Queensland., *Mitchell*; Broad Sound, *R. Brown*; Newcastle range, between Gilbert and Burdekin rivers, *P. Mueller*.

3. ***D. Pittosporoides***, *F. Muell.* in *Trans. Phil. Inst. Vict.* iii. 30. A tree, the trunk, according to Thozet, beautifully striated. Leaves lanceolate or rarely ovate-lanceolate, obtuse, 2 to 3 or rarely 4 in. long, obtusely serrate, narrowed into a petiole, coriaceous, with very prominent pinnate and reticulate veins, not so glaucous as in the other two species. Cymes pedunculate, few-flowered, on short leafless branches on the old wood or at the base of young leafy branches. Calyx-segments broadly orbicular. Petals ovate, about 1 line long, rather thick at the base. Ovary fleshy, completely 3-celled, with 3 or 4 ovules in each cell. Capsule globular, attaining in our specimens $\frac{1}{2}$ in. or rather more, but many of them opening when not half that size, the thick woody valves bearing the dissepiments on their centre.

Queensland. Wide Bay, *Bidwill*; sources of the Burnett river, *C. Moore*; Rockhampton, *Thozet*; Warwick, *Beckler*; Keppel Bay and Fitzroy river, *Herb. F. Mueller*.

4. **ELÆODENDRON**, *Jacq. f.*

Flowers often polygamous. Calyx 4- or 5-cleft, rarely 3-cleft. Petals as many as calyx-segments, spreading. Disk thick. Stamens as many as petals, inserted under the edge of the disk; filaments short; anthers nearly globular. Ovary continuous with the disk, conical, 3-celled, rarely 2- or 4- or 5-celled; style very short; ovules 2 in each cell. Drupe succulent or nearly dry, the putamen hard, 1-2- or 3-celled. Seeds usually solitary, without any arillus; testa membranous or spongy; albumen scanty or copious, cotyledons flat.—Shrubs or small trees, usually quite glabrous. Leaves opposite or alternate, entire or crenate. Flowers small, in dichotomous cymes, usually axillary or lateral, often clustered.

The species are numerous in East India and southern Africa, with a very few in tropical America; none are known from tropical Africa. The two Australian ones are endemic.

Ovary 2-celled. Drupe red. Veins of the leaves scarcely conspicuous above 1. *E. australe*.
Ovary 3-celled. Drupe black. Veins of the leaves conspicuous on both sides 2. *E. melanocarpum*.

1. ***E. australe***, *Vent. Jard. Malm.* t. 117. A glabrous, small or middle-sized tree. Leaves opposite, or here and there alternate, ovate, obtuse, elliptical, or oblong-lanceolate, obtuse or obtusely acuminate, 2 to 4 in. long, entire or broadly crenate, narrowed into a very short petiole, coriaceous, the reticulate veins slightly prominent underneath and scarcely conspicuous above. Flowers 4-merous, in slender cymes, much shorter than the leaves. Calyx-segments broadly ovate. Petals from a little more than 1 line to nearly 2 lines long, ovate, often broadly and shortly 3-lobed. Ovary confluent with the disk in a conical mass, 2-celled; style either very short or attaining $\frac{2}{3}$ line. Drupe ovoid or globular, rarely above $\frac{1}{2}$ in. long, of a bright-red colour, which it often retains in the dried specimens. Putamen hard and woody, usually 1-seeded, but showing the traces of the abortive cell.



Albumen copious.—F. Muell. *Fragm.* iii. 61; *Portenschlagia australis*, Tratt. *Arch.* t. 250.

Queensland. Wide Bay and Moreton Bay, *C. Moore*; Ipswich, *Nernst.*

N. S. Wales. Hunter's River, *R. Brown*; Hastings, Macleay, and Clarence rivers, *Beckler*; Illawarra, *A. Cunningham* and others; Kiama, *Harvey*.

Var. *angustifolia*. Leaves lanceolate or narrow-oblong, entire or nearly so; fruit more ellipsoid. *Portenschlagia integrifolia*, Tratt. *Arch.* t. 281; *Elæodendron integrifolium*, G. Don, *Gen. Syst.* ii. 12. — Burnett, Dawson, and Pine rivers, in Queensland, F. Mueller; Warwick, *Beckler*.

According to F. Mueller, the fruit in *E. australe* is occasionally 3-celled; but this must be rarely the case, as I have never found more than 2 cells to the ovary in any of the numerous specimens I have examined. The above references to Trattinick's Archiv are quoted after G. Don; I do not find the second volume of that work in any of our libraries.

2. **E. melanocarpum**, F. Muell. *Fragm.* iii. 62. A glabrous tree. Leaves opposite, obovate or oval-elliptical, broadly crenate, scarcely to be distinguished from those of *E. australe*, except that the veins are more conspicuous on the upper as well as the lower side. Flowers smaller than in *E. australe*, the males more numerous, in slender cymes like those of the small-flowered Indian *Hippocratea*, usually 3-merous. Female flowers in less-branched cymes and often 4-merous. Ovary 3-celled, but very imperfect in the flowers examined. Drupe ovoid or globular, shining-black, rather larger than in *E. australe*, the hard putamen always 3-celled, or showing the traces of a second or third cell when reduced to one. Albumen copious.

N. Australia. Arnhem North Bay, *R. Brown*.

Queensland. Keppel Bay, *R. Brown*; Port Bowen, *A. Cunningham*; Fitzroy and Lizard Islands, *M'Gillivray*; Port Denison, *Fitzalan*; Rockhampton, *Thozet*.

5. SIPHONODON, Griff.

Calyx 5-elext. Petals 5, spreading. Disk not distinct from the base of the calyx. Stamens 5, connivent round the pistil, the filaments flattened. Ovary half immersed in the disk or base of the calyx, conical, the summit hollowed and stigmatic in the cavity round a central style-like column; cells numerous, in 2 to 4 series; ovules solitary in each cell, alternately ascending and pendulous. Drupe globular, hard-fleshy, with numerous 1-seeded bony pyrenes superposed in rings of about 10 round the central axis. Testa of the seed membranous; albumen almost horny; cotyledons large, flat; radicle short.—Glabrous trees. Leaves alternate, entire or crenate. Stipules minute, deciduous. Peduncles short, axillary, few-flowered.

Besides the Australian species, which is endemic (and referred to this genus from the fruit), it comprises only one from the Indian Archipelago, from which the floral characters are taken.

1. **S. (?) australe**, Benth. A tree of 40 ft. or more. Leaves obovate or broadly oblong, obtuse, 2 to 3 in. long, entire or slightly sinuate, coriaceous, drying of the pale colour so frequent in *Celastrinæ*. Flowers unknown. Peduncles very short, bearing 1 or 2 fruits on pedicels of $\frac{1}{4}$ to $\frac{1}{2}$ in., as in *S. celastrineus*, Griff. Drupe globular, $\frac{3}{4}$ to 1 in. diameter, the flesh hard and dry, with the stigmatic scar at the top, and the scar of the calyx at the base, as in *S. celastrineus*. Nuts numerous, appearing to have been arranged in 2 rows in each of 5 cells, irregularly ovoid, somewhat compressed, 3 to 4

lines long. Testa of the seed brown; albumen not very thick; cotyledons broadly ovate.

Queensland. Brisbane river, *A. Cunningham*.

N. S. Wales. Clarence river, *Beckler*.

Until the flowers have been seen, this plant must remain in some measure doubtful, but the habit and fruit are so nearly those of *S. celastrioides*, that I have little hesitation in referring it to that genus. The ovary must probably be considered as 5-celled with many ovules in each cell, separated by spurious transverse dissepiments.

TRIBE II. HIPPOCRATEÆ.—Stamens usually 3 only, with a 5-merous calyx and corolla, inserted on the disk itself; filaments usually incurved at the base but recurved under the anther, which thus opens outwards. Seeds without albumen.

6. HIPPOCRATEA, Linn.

Calyx small, 5-cleft. Petals 5, valvate or imbricate. Stamens usually 3, the filaments thick at the base, connivent round the ovary, recurved at the top; anthers at first divided into 2 or 4 cells, at length confluent into 1 transverse cell. Disk conical or broad. Ovary 3-celled, style short, stigma 3-lobed; ovules 2 or more in each cell. Fruit of 3 distinct, flat, coriaceous carpels, opening along the middle in 2 boat-shaped valves. Seed compressed, usually produced at the base into a wing adnate to the raphe; albumen none; embryo in the upper end of the seed; cotyledons flat, connate; radicle inferior.—Small trees or woody climbers. Leaves opposite, entire or serrate. Stipules very small and deciduous. Flowers in axillary cymes or panicles.

A large genus, widely distributed over tropical Asia, Africa, and America, the Australian species being one of the common Asiatic ones. It belongs to the section with comparatively large flowers and valvate petals. The other section common in India, including *H. indica*, with minute globular flowers and imbricate petals, has not yet been observed in Australia.

1. ***H. obtusifolia*, Roxb.**; *W. and Arn. Prod.* 104, var. *barbata*. A tall, woody, glabrous climber. Leaves ovate, obovate, or oblong, obtuse or obtusely acuminate, 2 to 4 in. long, entire, coriaceous, somewhat shining. Flowers in short, loose, axillary cymes, the upper ones forming sometimes large leafy terminal panicles. Petals fully 2 lines long, lanceolate, rather thick, valvate in the bud, and in the Australian specimens bearded inside above the middle, the disk and ovary also occasionally villous or pubescent. Ovules 6 to 10 in each cell of the ovary. Carpels about 2 in. long, either broadly oblong and entire or broader and emarginate at the top.—*H. macrantha*, Korth. Verhand. Nat. Gesch. Bot. 187, t. 39; *H. barbata*, F. Muell. in Trans. Phil. Inst. Vict. iii. 28.

Queensland. Moreton Bay, *W. Hill*, *F. Mueller*.

N. S. Wales. Clarence river, *Beckler*. The species is widely distributed over tropical Asia. The common Indian form, figured in Wight, Ic. t. 963, has glabrous petals, but the variety with bearded petals as described by Korthals from Borneo, and of which we have specimens from Ceylon, is the same as the Australian one; and the amount of hairiness both on the petals and ovary appears to be variable.

ORDER XXXV. STACKHOUSIEÆ.

Flowers regular, hermaphrodite. Calyx small, 5-lobed or 5-cleft. Petals

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5, perigynous, with elongated claws, usually free at the base, but united upwards in a tubular corolla, with spreading lobes, imbricate in the bud. Disk thin, lining the calyx-tube. Stamens 5, inserted on the margin of the disk; filaments free, slender; anthers oblong. Ovary free, 2- to 5-lobed, 2- to 5-celled; style single, with 2 to 5 lobes, stigmatic along the inner side. Ovules solitary in each cell, erect, anatropous. Fruit of 2 to 5 globular, angular, or winged indehiscent cocci, at length seceding from the axis. Seeds solitary, erect; testa membranous; albumen fleshy; embryo straight; cotyledons short; radicle inferior.—Herbs, usually forming a perennial stock, with erect, little branched, virgate stems, often assuming a yellowish colour, rarely dwarf and tufted. Leaves alternate, narrow, entire, often somewhat fleshy. Stipules none or very minute. Flowers in terminal spikes, rarely solitary, with 3 minute or linear bracts (1 bract and 2 bracteoles) at their base. Stamens included in the corolla-tube, of very unequal lengths. Pistil almost always 3-merous.

The Order is limited to a single genus, almost endemic in Australia, one species extending to the Philippine Islands, and another represented by a closely allied species in New Zealand.

1. STACKHOUSIA, Sm.

(*Tripterococcus*, *Endl.*; *Plokostigma*, *Schuch.*)

Characters and distribution those of the Order.

Corolla-lobes oblong, obtuse.

Flowers solitary, terminal, sessile among the leaves of dwarf tufted stems 1. *S. pulvinaris*.

Stems elongated. Spikes terminal.

Cocci acutely angled or winged. Leaves obovate or obovate-oblong 2. *S. spathulata*.

Cocci obovoid or globular, reticulate. Leaves lanceolate, linear or filiform.

Spikes dense at the top, usually interrupted as the flowering advances. Flowers 4 to 6 lines long.

Leaves flat, lanceolate or linear or rarely terete. Bracts small 3. *S. monogyna*.

Leaves very narrow or terete. Bracts filiform.

Spikes or the whole plant pubescent 4. *S. pubescens*.

Glabrous except sometimes the cocci 5. *S. Huegelii*.

Spikes short, dense. Flowers about 3 lines long 6. *S. flava*.

Spikes filiform. Flowers distant, not 3 lines long. Leaves narrow, often very few 7. *S. muricata*.

Corolla lobes acute or acuminate.

Cocci obovoid or globular, reticulate. Corolla 3 lines or less.

Spikes short, dense. Leaves linear 6. *S. flava*.

Spikes long and slender. Flowers or clusters of flowers distant.

Leaves oblong or linear, sometimes few or very small

Flowers few, solitary along the broom-like branches. Leaves all reduced to minute scales 8. *S. viminea*.

Cocci broadly winged. Corolla more than 4 lines, with filiform points to the lobes 9. *S. scoparia*.

10. *S. Brunonis*.

1. ***S. pulvinaris***, *F. Muell.* in *Trans. Phil. Soc. Vict.* i. 101; *Fragsm.* ii. 359, iii. 88; and *Pl. Vict.* ii. t. 14. A dwarf, glabrous, much branched, and densely tufted or prostrate herb. Leaves crowded, linear-oblong, obtuse, rather thick, usually 3 or 4 lines long. Flowers solitary and almost sessile amongst the last leaves, and but little exceeding them. Bracts very small, obtuse. Calyx-lobes ovate. Corolla about 3 lines long, with oblong obtuse

lobes, a little shorter than the tube. Anthers glabrous. Coccii rather large in proportion to the plant, smooth or obscurely reticulate.—Hook. f. Fl. Tasm. ii. 359.

Victoria. Summits of the higher mountains of Gipps' Land, at an elevation of 6000 to 7000 ft., *F. Mueller*.

Tasmania. Western mountains, *Archer*.

S. minima, Hook. f., from New Zealand, differs very slightly in the acute lobes of the corolla and pubescent anthers.

2. **S. spathulata**, *Sieb.* in *Spreng. Syst. Cvr. Post.* 124. Glabrous, usually much branched at the base, with stout decumbent or ascending branches of about $\frac{1}{2}$ ft., but sometimes lengthening to 1 ft. or more. Leaves from obovate to oblong, usually very obtuse, rather thick, and $\frac{1}{2}$ to $\frac{3}{4}$ in. long, but in luxuriant stems lengthening out to 1 in. or more and almost acute. Spikes dense, with the flowers almost of *S. monogyna*. Corolla-tube 3 to 4 lines long, lobes much shorter, oblong, obtuse. Coccii fully 2 lines long, with 3 prominent vertical acute angles or narrow wings.—*F. Muell. Fragm.* iii. 86; *S. maculata*, *Sieb.* in *Hook. Journ. Bot.* ii. 421; *Hook. f. Fl. Tasm.* i. 79 (the name originating in a clerical error in Sieber's label); *Triptero-coccus spathulatus*, *F. Muell.* in *Hook. Kew Journ.* viii. 208; *Schuch.* in *Linnaea*, xxvi. 20; *F. Muell. Fragm.* iii. 86; *S. monogyna*, *Labill. Pl. Nov. Holl.* i. 77, t. 104 (as to the fruit).

Queensland. Sandy Cape, Hervey Bay, *R. Brown*; Moreton Island, *McGillivray*, *F. Mueller*.

N. S. Wales. Southward of Botany Bay, *R. Brown*; Port Jackson, *Sieber*, n. 246, and others; frequent on the seashore, *A. Cunningham*; and on all the grass-lands of the interior, *Fraser* (but probably confounded with *S. monogyna*); Hastings river, *Beckler*.

Victoria. Seacoast, Wilson's Promontory, Portland Bay, etc., *F. Mueller*.

Tasmania. Islands of Bass's Straits, *Gunn*, *Rynoc.* A specimen not in fruit from Recherche Bay, *C. Stuart*, is also probably the same.

S. Australia. Mouth of the Glenelg and Rivoli Bay, *Allitt*.

3. **S. monogyna**, *Labill. Pl. Nov. Holl.* i. 77, t. 104 (partly). Glabrous, with a perennial base, and erect, simple or slightly branched, stout or slender stems, usually 1 to $1\frac{1}{2}$ ft., but sometimes twice that height. Leaves linear or lanceolate, acute or obtuse, crowded or few and distant, usually $\frac{1}{2}$ to 1 in. long, or when very luxuriant 2 in. Racemes at first dense, but often lengthening out to 4 or 5 in., the lower bracts sometimes leaf-like, passing into the very small lanceolate upper ones, and often all very small. Calyx-lobes narrow. Corolla-tube 3 to 4 lines long; lobes much shorter, oblong, obtuse. Coccii obovoid, prominently reticulate, not angled.—*Lindl. Bot. Reg.* t. 1917; *Hook. f. Fl. Tasm.* i. 79; *S. obtusa*, *Lindl.* in *Bot. Reg.*, under n. 1917; *S. linearifolia*, *A. Cunn.* in *Field. N. S. Wales*, 356; *F. Muell. Fragm.* iii. 87; *S. Gunnii*, *Hook. f. Fl. Tasm.* i. 79; *Schlecht. Linnaea*, xx. 642; *S. aspericocca*, *Schuch.* in *Linnaea*, xxvi. 12; *S. Muelleri*, *Schuch.* t. c. 16; *S. Gunniana*, *Schlecht.* in *Schuch.* t. c. 18.

Queensland. Keppel Bay, Broad Sound, *R. Brown*; Port Curtis, *McGillivray*; Dawson and Bowen rivers, *F. Mueller*.

N. S. Wales. Richmond and Grose river, *R. Brown*; Blue Mountains, and plains and country about Bathurst, also southward of Port Jackson, *A. Cunningham* and others; Twofold Bay, *F. Mueller*.

Victoria. Common in fertile as well as in sterile soils, ascending in the Alps to 4500 ft., *F. Mueller*.

Tasmania. Derwent river, *R. Brown*; abundant throughout the island, *J. D. Hooker*.

S. Australia. From the Murray to Spencer's Gulf, and in the interior to Lake Torrens, *F. Mueller*.

Although Labillardière confounded this species with *S. spathulata*, and represented and described the fruit of the latter species, yet the common air, of which he described the flowering specimens, has been so universally known under his name, that it would only increase the confusion to adopt a later name for that species. Among its numerous forms, the luxuriant specimens with more conical spikes which commonly pass for the true *S. monogyna*, and the smaller ones with fewer flowers and the young spike more obtuse, published by Lindley as *S. oblonga*, pass into each other by innumerable gradations. It is to the former that Schlechtendal gave the name of *H. Gaunii*, whilst Hooker's variety of that name is nearer to *H. obtusa*. A rather more distinct variety, with elongated slender stems, narrow and more distant leaves, sometimes very few and small, and rather smaller flowers, with smaller and smoother cocci, is amongst the more common Victorian and S. Australian forms, and is more especially the *S. huuegelii*, A. Cunn., or *S. Muelleri*, Schuch. It has sometimes the almost terete leaves of *S. Huegelii*, from which it then differs in its very short bracts. The calyx in this variety is often strongly ribbed after flowering, but still more so in a slender northern variety, which has larger almost muricate cocci. A few Queensland specimens (Port Denison, *Tizalan*), very slender, with small flowers in short dense spikes, seem almost to connect this with *S. muricata*. Indeed, different as are the extreme forms, the numerous specimens I have had before me show scarcely any definite limits between *S. monogyna*, *pubescens*, *Huegelii*, *flava*, *muricata*, and *viminea*.

4. **S. pubescens**, *A. Rich.*, *Sert. Astro.* 89, t. 33. Stems usually erect, nearly simple, 1 to 1½ ft. high, glabrous or pubescent. Leaves very narrow-linear, often 1 in. long in the lower part of the plant, glabrous or pubescent. Spike at first dense and conical, elongating to 2 or 3 in., always pubescent. Bracts linear, subulate-acuminate, usually exceeding the young buds. Calyx-lobes acuminate, usually strongly ciliate. Corolla of the size and shape of that of *S. monogyna*, with oblong obtuse lobes. Cocci strongly reticulate, usually pubescent.—Bunge, in *Pl. Preiss.* i. 180; Schuch. in *Linnæa*, xxvi. 10; *Plokistigma Lehmanni*, Schuch. l.c. 40 (young buds, with the style not yet grown out).

W. Australia. King George's Sound, *R. Brown*, *Lesson*, *Oldfield*; Swan River, *Drummond*, *Preiss*, n. 1972, and others; Rottenest Island, *Preiss*, n. 1364.

5. **S. Huegelii**, *Endl.* in *Hueg. Enum.* 17. Glabrous, with erect nearly simple stems of $\frac{1}{2}$ to 1½ ft., with a terminal spike at first dense, afterwards elongated as in *C. monogyna*, and the flowers about the same size, with oblong, obtuse corolla-lobes; but the leaves are very narrow-linear, often almost terete, and the bracts and calyx-lobes also very narrow, as in *S. pubescens*, from which this species differs slightly in the want of any pubescence, excepting sometimes in the cocci.—Schuch. in *Linnæa*, xxvi. 14.

W. Australia. Swan River, and northward to Murchison river, *Drummond*, *Oldfield*, and others; King George's Sound, *R. Brown*; Kalgan river, *Oldfield*; Stirling ranges, *Maxwell*. This ought perhaps to be considered as a variety only of *S. pubescens*.

6. **S. flava**, *Hook. Ic. Pl.* t. 269. Glabrous. Stems numerous, branching at the base, decumbent or ascending to from 6 in. to 1 ft. in height. Leaves linear, flat, rarely above $\frac{1}{2}$ in. long, rather thick, those of the short sterile branches sometimes broader and oblong. Flowers yellow, much smaller than in *S. monogyna*, clustered in short, dense, terminal spikes, the pedicels

often $\frac{1}{2}$ line long. Bracts very short, broad and obtuse. Calyx small, with ovate lobes. Corolla about 3 lines long, with oblong-lanceolate, rather acute lobes. Coccii not seen.—Hook. f. Fl. Tasm. i. 80; Schuch. in *Linnaea*, xxvi. 26.

Tasmania. Woolnorth, in poor sandy soil, *Gunn*.

W. Australia. Flinders Bay, *Collie* (with the spike rather more elongated).

7. **S. muricata**, *Lindl.* in *Bot. Reg.* under n. 1917. Glabrous. Stems slender, simple or branched, often above $1\frac{1}{2}$ ft. long. Leaves narrow-linear, sometimes almost filiform, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Spikes long, very slender, with distant clusters of 2, 3, or more small flowers, usually under 3 lines and sometimes not 2 lines long. Calyx-lobes small, obtuse. Corolla-lobes narrow but obtuse, sometimes as long as the tube, sometimes not half so long. Coccii strongly reticulate, sometimes almost muricate.—Schuch. in *Linnaea*, xxvi. 25.

N. Australia. Sturt's Creek, *F. Mueller*.

Queensland. Port Essington, *Armstrong*; Port Curtis and Dunk Island, *M'Gillivray*; Brigalow scrub in the interior, *Mitchell*; Peak Downs, *F. Mueller*.

N. S. Wales. St. George's river, *R. Brown*; Peel's Range on the Lachlan, *A. Cunningham*.

This species, which we have also from the Philippine Islands, varies considerably and sometimes approaches *S. viminea*, but the leaves are never so broad, and the corolla-lobes obtuse. The Sturt's Creek specimens belong to a more branched and compact form, with very small flowers more frequently solitary, and the leaves few, small, and distant. Some smaller specimens, like those from the Philippine Islands, are less branched and perhaps sometimes annual.

8. **S. viminea**, *Sm.* in *Rees' Cyc.* xxxiii. Glabrous. Stems erect or ascending, slender, often 1 to $1\frac{1}{2}$ ft. high. Leaves on the barren shoots often rather broad, oblong, obtuse, $\frac{1}{2}$ to 1 in. long, narrowed at the base, on the flowering-stems fewer, often small and narrow-linear, and sometimes scarcely any. Spike slender, elongated, with distant clusters of small flowers, sometimes numerous in the clusters, sometimes solitary or nearly so. Calyx small, with acute lobes. Corolla rarely exceeding 3 lines and often not above 2 lines long, slender, with narrow acuminate or acute lobes. Coccii small, strongly reticulate or muricate.—Schuch. in *Linnaea*, xxvi. 22; *S. nuda*, *Lindl.* in *Bot. Reg.* under n. 1917; Schuch. l. c. 22; *S. monogyna*, *Sieb.* Pl. Exs.; *S. dorypetala*, Schuch. l. c. 24.

N. Australia. Islands of the Bay of Carpentaria, *R. Brown*; Goulburn Island, *A. Cunningham*.

Queensland. Warwick, *Beckler*.

N. S. Wales. Port Jackson and to the southward, *R. Brown*, *A. Cunningham*, *Sieb.*, n. 245 and 591, and others; Blue Mountains, *Miss Atkinson*; New England, *C. Stuart*; Macleay and Clarence rivers, *Beckler*.

W. Australia. Swan River, *Drummond*, n. 92; Phillips river, *Maxwell*; between Moore and Murchison rivers, *Drummond*, n. 81.

Var. *elata*. Branches numerous and more erect, attaining 5 ft. according to Maxwell, but several of Drummond's are under 1 ft.; leaves all narrow; the whole plant drying more yellow than usual in the eastern variety, although some specimens of the latter are also yellow.—*S. elata*, *F. Muell. Fragn.* iii. 86. To this variety belong Maxwell's specimens above mentioned and Drummond's n. 92. A few Port Jackson ones can scarcely be distinguished from them.

Var. *micrantha*. Small, slender, and much-branched; flowers small, as in *S. muricata*, but the acuminate lobes as well as the narrow leaves are those of *S. viminea*.—To this are

referrible Drummond's specimens, n. 81, and R. Brown's and Cunningham's from the N. coast.

The distinction between this species and *S. muricata*, and the value of the character derived from the acute or obtuse corolla-lobes, requires further investigation on the living plant.

9. **S. scoparia**, Benth. Glabrous, erect, with numerous stout, rigid, broom-like, apparently leafless branches, 8 to 10 in. high in our specimens. Leaves all reduced to minute distant scales. Flowers small, solitary and distant along the ends of the branches, shortly pedicellate, with minute bracts. Calyx-lobes narrow and acute. Corolla about $2\frac{1}{2}$ lines long, with narrow acuminate lobes about as long as the tube. Coccii not seen.

W. Australia. Between Swan River and King George's Sound, *Drummond*.

10. **S. Brunonis**, Benth. Glabrous. Stems erect, simple or branched, attaining 1 to 2 ft. or even more. Leaves narrow-linear or almost terete, usually free and small, except at the base of some of the stems, rarely more generally scattered and attaining $\frac{1}{2}$ to 1 in. Spikes sometimes short and crowded, but more frequently elongated, with rather distant shortly pedicellate flowers. Bracts subulate, very variable in length. Calyx-lobes narrow-linear or acuminate. Corolla-tube slender, usually about 3 lines long, but varying from $2\frac{1}{2}$ to $3\frac{1}{2}$ lines; lobes narrow, acuminate, often almost subulate, as long as the tube or much shorter. Coccii with 3 longitudinal scarious wings, marked with transverse veins, the 2 marginal ones from 1 to 2 lines broad, the dorsal one much narrower, but all remarkably variable in width even on the same specimen.—*Triplerococcus Brunonis*, Endl. in Hueg. Eauth. 18; Schuch. in Linnaea, xxvi, 31; *T. simplex*, Bunge, in Pl. Preiss. i. 181; Schuch. l. c. 35; *T. junceus*, Bunge, l. c. 181; Schuch. l. c. 37; *T. brachystigma*, Schuch. l. c. 33.

N. Australia. Regent river, N.W. coast, *A. Cunningham*.

W. Australia. King George's Sound, R. Brown, *Fraser*, and others, to Swan River and Murchison river, *Drummond*, *Oldfield*, and others; *Preiss*, n. 1971 and 1973.

ORDER XXXVI. RHAMNEAE.

Flowers regular, hermaphrodite, or rarely polygamous. Calyx campanulate, ureolate, or cylindrical, the tube persistent and often adnate to the ovary or disk; lobes 4 or 5, valvate, usually with a raised longitudinal line inside and deciduous. Petals 4 or 5, concave or hood-shaped, inserted at the base of the calyx-lobes, alternating with and rarely exceeding them, or none. Stamens 4 or 5, alternating with the calyx-lobes, inserted with the petals and opposite to them when present; filaments short, filiform; anthers small, often enclosed in the petals, rarely oblong or exserted. Disk rarely wanting, usually filling the calyx-tube or lining it, or annular round the ovary when inferior, rarely cup-shaped and free. Ovary sessile on the disk or immersed in it, or more or less inferior, 3-celled, or rarely 2- or 4-celled; style short, entire, or with as many lobes or branches as ovary-cells; stigmas terminal, capitate or club-shaped. Ovules solitary in each cell, erect, anatropous, with a dorsal or rarely lateral raphe. Fruit a drupe or capsule, the border of the adnate base of the calyx forming a ring at the base or round the fruit or at the summit;

epicarp thin and dry or fleshy; endocarp separating into as many membranous coriaceous or hard cocci as cells, or woody or bony, divided into cells. Seeds solitary, erect, usually ovate and somewhat compressed, often arillate; testa coriaceous or crustaceous and shining or rarely membranous; albumen fleshy or almost horny, often scanty, rarely wanting; embryo usually straight, with flat rather thick cotyledons and a short inferior radicle. Shrubs or trees, very rarely, in genera not Australian, herbs, erect or climbing. Leaves alternate or rarely opposite, undivided, entire, or toothed. Stipules usually present but very deciduous, rarely spinous and persistent. Flowers small, usually green or yellowish, in cymes or umbel-like clusters, either solitary or forming axillary or terminal compound cymes, racemes or panicles.

A considerable Order, ranging over the tropical and temperate regions of both the New and the Old World. Of the 12 Australian genera, 3 are widely spread tropical or northern genera, and 1 tropical Asiatic, all represented in Australia by single or very few species, a fifth is South American, with one Australian and one New Zealand species, the remaining 7, several of them numerous in species, are endemic or nearly so; *Alphitonia* extending to the Pacific islands, and *Pomaderris* to New Zealand. The Order is a well-marked one, the floral characters separating it very readily from all except *Ampelidaceæ*, from which it is distinguished by the habit, by the drupaceous or capsular, not baccaate fruit, and by the seeds; but most of the genera, even the most natural ones, are difficult to characterize. The differences in their flowers and fruits are very trifling; they often pass into each other by the finest gradations, and habit, foliage, and inflorescence must often be relied upon for fixing generic limits.

Calyx spreading. Disk broad, concave or filling the calyx-tube.

Ovary free or immersed in the disk. Leaves usually alternate, rather large, often serrate. Fruit above 2 lines long or broad, succulent or dry.

Leaves 3- or 5-nerved.

Drupe succulent, the perianth woody or bony, 1- to 4-celled.

Stipules usually spinescent. 2. ZIZYPHIUS.

Drupe with a thin epicarp, covering membranous or crustaceous cocci. Unarmed 4. COLUBRINA.

Leaves pinnnerveined.

Panicle branches elongated and raceme-like. Nut 1-seeded, produced into a long wing-like appendage 1. VENTILAGO.

Panicle or cyme 2-3-chotomous. Endocarp separating into cocci.

Ovary immersed in the disk. Epicarp thick. Leaves white or rusty underneath 5. ALPHITONIA.

Ovary sessile on the disk. Epicarp thin. Leaves green on both sides 6. EMMENOSPERMUM.

Flowers in axillary clusters. Ovary sessile on the disk. Epicarp succulent 3. RHAMNUS.

Calyx campanulate or tubular. Disk none, or annular, or lining the calyx-tube. Ovary partially or wholly inferior. Leaves alternate, usually small and entire (except a few *Pomaderrises*). Fruit under 2 lines diameter.

Calyx-tube entirely adnate, or lined by the disk up to the lobes.

Petals none, or concave, not enclosing the anthers, which are either oblong or on long filaments. Flowers usually pedicellate. Bracts very deciduous 7. POMADERRIS.

Petals enclosing the small anthers. Flowers pedicellate. Bracts very deciduous 8. TRYMALIUM.

Petals enclosing the small anthers. Flowers sessile, surrounded by small, imbricate, persistent, brown bracts 9. SPYRIDIUM.

Calyx-tube produced above the ovary and disk.

Flowers sessile or nearly so, in cymes, often contracted into heads surrounded by imbricate brown bracts 10. *STENANTHEMUM*.
 Flowers solitary or in leafy spikes, sometimes contracted into heads, or pedicellate, individually surrounded by brown bracts 11. *CRYPTANDEA*.
 Calyx campanulate or tubular, the tube produced above the ovary and annular disk. Spines and small leaves opposite 12. *DISCARIA*.

1. VENTILAGO, Gærtn.

Calyx 5-lobed, spreading. Petals hood-shaped or none. Stamens 5, scarcely exceeding the petals when present. Disk flat or concave, filling the short calyx-tube. Ovary more or less immersed in the disk, 2-celled; style short, with 2 short erect stigmatic lobes. Nut globular at the base, produced into an oblong or linear coriaceous wing, 1-celled and 1-seeded, indehiscent. Seed globular; testa membranous; albumen none; cotyledons thick and fleshy.—Climbing shrubs or trees. Leaves alternate, penninerved. Flowers small, clustered along the branches of axillary or terminal panicles.

The genus is dispersed over the tropical regions of the Old World. The Australian species is endemic, differing from the others in habit and foliage as well as in the absence of petals.

1. *V. viminalis*, Hook. in *Mitch. Trop. Austr.* 369. A small glabrous tree. Leaves narrow-lanceolate, 2 to 4 or even 5 in. long, entire, narrowed into a petiole, coriaceous, the pinnate veins very oblique and sometimes almost parallel with the midrib, without the elegant transverse venation of the rest of the genus. Panicles not much branched, or almost reduced to simple racemes, shorter than the leaves, solitary or clustered in the axils. Calyx about 1 line long. Petals none. Disk entirely adnate to the short broad calyx-tube. Ovary slightly immersed in the disk. Fruit glabrous, about 1 in. long, including the wing, the turbinate adnate base of the calyx not attaining above a quarter the length of the globular nut.

N. Australia. Nicholson river, Gulf of Carpentaria, *F. Mueller*.

Queensland. High sandy ridges on the Maranoa, *Mitchell*.

N. S. Wales. Tributaries of the Upper Darling river, *Bowman*.

2. ZIZYPHUS, Juss.

Calyx 5-lobed, spreading. Petals hood-shaped or rarely none. Stamens 5, included in the petals or scarcely exceeding them, when present. Disk flat, filling the short calyx-tube. Ovary immersed in the disk, 2-, rarely 3- or 4-celled; style shortly branched or styles distinct; stigmas small. Drupe ovoid or globular, putamen woody or bony, 1- to 4-celled, 1- to 4-seeded. Seeds with a smooth fragile testa; albumen none or scanty; cotyledons thick.—Trees or shrubs, usually armed with stipular prickles. Leaves alternate, 3- or 5-nerved, often distichous and very oblique. Flowers small, greenish, in axillary cymes. Fruit often edible.

The genus ranges over the tropical and subtropical regions of the New and the Old World. Two of the Australian species are also common Asiatic ones, the third is endemic.

Leaves green on both sides, softly pubescent or villous, or at length glabrous. Drupe small, 2-celled 1. *Z. Enoplia*.

Leaves white or rusty underneath, with a close tomentum.

Ovary and drupes 2-celled	2. <i>Z. jujuba</i> .
Ovary and drupes 4 celled	3. <i>Z. quadrilocularis</i> .
(<i>Z. melastomoides</i> , A. Cunn. Herb. and Steud. Nom., is a <i>Celtis</i> .)	

1. ***Z. Enoplia***, Mill.; *W. and Arn. Prod.* 163 (with the synonyms adduced, except *Z. Napeca*). A shrub of several feet, with very divaricate branches, the young ones rusty-pubescent or villous. Stipular spines short, in pairs, one straight and deciduous, the other hooked or recurved and more persistent. Leaves very obliquely ovate, obtuse or slightly acuminate, 1 to 2 in. long, entire or crenulate, 3- or 5-nerved, membranous, green on both sides, softly pubescent or villous, especially underneath, or sometimes glabrous when full grown. Cymes small, compact, few-flowered, and almost sessile. Ovary 2-celled, style short, the stigma scarcely divided. Drupe globular, 2 or 3 lines diameter, 2-celled or 1-celled by abortion.—*Z. celtidifolia*, DC. *Prod.* ii. 20 (from the character given); Fenzl, in Hueg. *Enum.* 20; *Z. rufula*, Miq. *Fl. Ind. Bat.* i. part 1, 643.

N. Australia. Islands of the Gulf of Carpentaria and Arnhem S. Bay, *R. Brown*. Common in East India and the Archipelago, but apparently not in Africa. Of the two Linnean *Rhamni* doubtfully referred here by Wight and Arnott, *R. Enoplia* is quite correct; *R. Napeca* however is *Zizyphus lucida*, Moon; Thw. *Enum. Pl. Ceyl.* 74. The Linnean herbarium has very good authentically named specimens of both.

2. ***Z. jujuba***, Lam.; *W. and Arn. Prod.* 162 (with the synonyms adduced). A tall shrub or small tree, with short stipular prickles, occasionally wanting. Leaves ovate or nearly orbicular, usually very obtuse, 1 to 3 in. long, entire or toothed, 3-nerved, glabrous above, covered underneath, as well as the petioles and branches, with a close white or rusty tomentum. Cymes small, compact, and nearly sessile. Ovary 2-celled, tapering into a short 2-lobed style. Drupe globular, usually about $\frac{1}{2}$ to nearly $\frac{3}{4}$ in. diameter, 2-celled or 1-celled by abortion.

Queensland. Torres Straits, *Dubouzet*. Very common, both wild and cultivated, throughout tropical Asia, extending also to tropical Africa.

3. ***Z. quadrilocularis***, F. Muell. *Fragm.* iii. 57. A tall shrub or small tree. Stipules lanceolate, appressed, very rigid and pointed, but not so spinous and more deciduous than in the other species. Leaves ovate, shortly acuminate, or rarely obtuse, 2 to 3 in. long, entire or scarcely crenulate, very oblique at the base, 3-nerved, glabrous above, rusty or hoary-tomentose underneath, as well as the young branches. Cymes small, dense, very shortly pedunculate. Ovary 4-celled, with a short 4-lobed style. Drupe globular, of the size of that of *Z. jujuba*, but the thick bony putamen 4-celled and 4-seeded.

N. Australia. Upper Victoria river, *F. Mueller*.

3. RHAMNUS, Linn.

Calyx 4- or 5-lobed, broadly campanulate or spreading. Petals hood-shaped, involute or nearly flat, or rarely none. Stamens 4 or 5, scarcely exceeding the petals when present. Disk broadly concave or lining the calyx-tube, with a free margin. Ovary free, sessile on the disk (not immersed), 2-celled in the Australian species, 3- or 4-celled in most others, tapering into a

style, with as many short stigmatic lobes as ovary-cells. Drupe succulent, globular or oblong, containing 2 to 4 bony or cartilaginous pyrenes, indehiscent or scarcely dehiscent. Seeds with a smooth testa; albumen fleshy; cotyledons flat or recurved.—Shrubs or trees. Leaves alternate, petiolate, pinninerved, entire or toothed, usually green on both sides. Stipules small, deciduous. Flowers in clusters, either axillary and solitary or in axillary or terminal racemes.

The genus is widely dispersed over the northern hemisphere, rare in tropical regions. The Australian species, which is in some measure doubtful, extends to the Fiji Islands.

1. **R (?) vitiensis**, Benth. Quite glabrous, the branches slender. Leaves ovate or oval-oblong, shortly acuminate, 2 to 3 in. long, entire or serrate-crenate, green on both sides, thin and apparently deciduous. Flowers in axillary sessile clusters, on slender pedicels of 3 or 4 lines. Calyx about 2 lines long, the tube broadly hemispherical, the lobes triangular, rather thin. Petals involute, enclosing the stamens. Disk concave, broadly cup-shaped, the margin free. Ovary broadly sessile, 2-celled, tapering into a short style. Fruit not seen.—*Colubrina vitiensis*, Seem. Syst. List Vit. Pl. 4.

Queensland. Cape York, M'Gillivray. Until the fruit is known, the genus of this plant cannot be free from doubt. The inflorescence and disk, however, are those of *Rhamnus*, and the species seems to differ from *R. javanica*, Miq., chiefly in its thinner leaves. Apparently the same species was gathered in the Fiji Islands by Seemann, and his specimens have young fruits, of an obovoid-oblong shape, which, as far as they go, agree with those of *Rhamnus*.

4. COLUBRINA, L. C. Rich.

Calyx 5-lobed, spreading. Petals hood-shaped. Stamens 5, included in the petals. Disk thick, filling the calyx-tube. Ovary immersed in the disk, 3- or rarely 4-celled, tapering into a 3-, rarely 4-cleft style, with obtuse stigmas. Drupe nearly globular, obscurely lobed, the epicarp thin or succulent, the endocarp separating into 3, rarely 4 membranous or crustaceous cocci, opening inwards by a longitudinal slit. Seeds without any arillus; testa smooth, shining, coriaceous; albumen fleshy but thin; cotyledons flat or incurved, thin or rather thick.—Erect or half-climbing shrubs or trees. Leaves alternate, 3-nerved at the base or pinninerved in species not Australian. Stipules small, deciduous. Flowers small, in axillary cymes or clusters.

The species are nearly all American, tropical or subtropical, with one from tropical Asia, extending also into Australia.

1. **C. asiatica**, Broun.; W. and Arn. Prod. 166 (with the synonyms adduced). A large shrub or small tree, unarmed, and quite glabrous, with long, slender, often flexuous branches. Leaves petiolate, ovate or broadly cordate, acuminate, 2 to 3 in. long, crenate-serrate, 3-nerved and pinninerved, smooth and shining, but scarcely coriaceous. Cymes shortly pedunculate, rarely exceeding the petioles. Flowers greenish, about 2 lines diameter. Fruit about 4 lines diameter, depressed at the top, furrowed opposite the dissepiments, the endocarp separating more or less perfectly into 3 or rarely 4 membranous cocci.

Queensland. Cape York, M'Gillivray; Cape Grafton and Rodd's Bay, A. Cunningham; Howick's Group, F. Mueller; Shoalwater passage, R. Brown; Port Denison, Fitzalan. The species is common in tropical Asia, extending to the Pacific islands.

5. ALPHITONIA, Reissek.

Calyx 5-lobed, spreading. Petals involute. Stamens 5, included in the petals. Disk thick, filling the calyx-tube. Ovary immersed in the disk, 2- or rarely 3-celled, tapering into a shortly lobed style. Drupe globular or broadly ovoid, the epicarp of a dry, mealy or somewhat corky substance; endocarp of 2 or 3 hard coriaceous nuts or cocci, opening inwards by a longitudinal slit. Seeds with a shining hard testa, completely enclosed in a membranous brown shining arillus, open at the top, but with the edges folded over; albumen cartilaginous or horny; cotyledons flat.—Tree. Leaves alternate, penninerved. Cymes dichotomous, many-flowered. Seeds often persisting on the torus after the pericarp has fallen off.

The genus is probably limited to a single species, ranging from Australia to the Pacific islands.

1. **A. excelsa**, Reissek, in Endl. Gen. 1098. A tall hard-wooded timber-tree, the young branches, petioles, and inflorescence hoary or rusty with a close tomentum. Leaves petiolate, varying from broadly ovate or almost orbicular and very obtuse, to ovate or lanceolate and acute or acuminate, usually 3 to 6 in. long, entire, coriaceous, glabrous or slightly hoary above, white, or rarely rust-coloured underneath with a close tomentum, the parallel pinnate veins very prominent. Flowers 2 to 3 lines diameter, in little umbel-like cymes, arranged in dichotomous cymes in the upper axils or in a terminal corymbose panicle. Calyx tomentose. Disk broad and nearly flat. Fruit 3 or 4 lines diameter, or sometimes rather larger.—*Colubrina excelsa*, Fenzl, in Hueg. Enum. 20.

N. Australia. Islands of the Gulf of Carpentaria (Cape Van Diemen), *R. Brown*; Sweers Island, *Henne*; Arnhem's Land, *F. Mueller*.

Queensland. Curtis Island, *Henne*; Rockhampton, *Thozet*; Port Denison, *Fitzalan*; Brisbane river, Moreton Bay, *A. Cunningham*, *Fraser*, *F. Mueller*, and others.

N. S. Wales. Hunter's, Paterson's, and Williams rivers, *R. Brown*; Hastings and Clarence rivers, *Beckler* and others; Blue Mountains, *Miss Atkinson*; Illawarra, *M'Arthur*.

The Carpentaria island specimens belong to a variety with remarkably large obtuse leaves, the flowers rather larger than usual, and the tomentum somewhat rusty. To this belongs *Zizyphus pomaderoides*, Fenzl, in Hueg. Enum. 20, judging from *R. Brown*'s specimens corresponding to Bauer's. *Alphitonia zizyphoides*, A. Gray, Bot. Amer. Expl. Exped. i. 278, t. 20 (*Rhamnus zizyphoides*, Soland.), which extends from Borneo and New Caledonia to the Pacific islands, does not appear to differ at all from some of the eastern Australian specimens; whilst *A. franguloides*, A. Gray, l. c. 280, is very like some of the more tomentose N. Australian specimens.

6. EMMENOSPERMUM, F. Muell.

Calyx 5-lobed, the tube campanulate. Petals hood-shaped, inserted with the stamens on the margin of the disk. Stamens 5, enclosed in the petals. Disk thin, lining the calyx-tube. Ovary inserted on the disk in the bottom of the calyx-tube, but not immersed, 2-celled or rarely 3-celled, tapering into a shortly-cleft style. Fruit almost capsular, with a very thin almost dry epicarp, the endocarp separating into 2 or rarely 3 cartilaginous almost crustaceous cocci, opening along the inner face in two valves. Seeds inserted on a turbinated or slightly cup-shaped funicle, without any arillus; testa hard and shining; albumen cartilaginous; cotyledons flat.—Trees. Leaves opposite



Abutilon

or alternate, penninerved. Cymes or panicles trichotomous, many-flowered. Seeds often persisting on the torus after the pericarp has fallen off.

The genus is endemic in Australia. It is closely allied in technical characters to the S. African *Nollia*, but with a different habit.

Leaves opposite or nearly so 1. *E. alphoniooides*,
Leaves alternate 2. *E. Cunninghamii*.

1. ***E. alphoniooides***, *F. Muell. Fragn.* iii. 63. A tall hard-wooded timber-tree, quite glabrous. Leaves opposite or nearly so, petiolate, ovate, acuminate, 2 to 3 in. long, entire, coriaceous, shining above, green on both sides. Flowers numerous, in little dense umbel-like cymes, arranged in trichotomous cymes or corymbose panicles in the upper axils or terminal. Calyx-lobes almost petal-like, nearly 1 line long. Fruits apparently about 3 lines long, but either unripe or already open in our specimen. Seeds persistent, like those of *Alphonolia*, but without the peculiar arillus of that species.

Queensland. Brush of Brisbane river, *M'Arthur*; Peri creek, *Leichhardt*.

N. S. Wales. Clarence river, *C. Moore*, *Wilcox*; Illawarra, known under the name of "Dogwood," *M'Arthur*, *Backhouse*, *Ralston*.

2. ***E. (?) Cunninghamii***, *Benth.* Leaves alternate, similar to those of *E. alphoniooides*, except that the petioles are longer. Flowers not seen. Umbel-like cymes apparently not numerous, in a terminal corymbose panicle. Fruits rather larger than in *E. alphoniooides*, 3- or 4-celled; epicarp scarcely any; cocci 2-valved. Seeds red and shining as in that species, but not persistent on the torus, and the funicle very small.

N. Australia. Port Warrender, N.W. coast, *A. Cunningham*. The specimens are very imperfect; they were referred to *Croton* by Cunningham, but the seeds are erect and present all the characters of *Rhamneæ*, as already observed by Planchon in *Herb. Hook.*

7. POMADERRIS, Labill.

Calyx-tube entirely adnate to the ovary, the limb divided to the base into 5 lobes, usually deciduous or reflexed. Petals either concave or nearly flat, not enclosing the anthers, or none. Stamens 5, the filaments long and usually suddenly inflected and attenuate near the top; anthers oblong or ovoid. Disk annular, surrounding the ovary at the base of the calyx-lobes, often scarcely conspicuous, and never very prominent. Ovary half-inferior or rarely almost entirely inferior. Style 3-cleft, or rarely almost entire. Capsule protruding above the border of the calyx-tube, septicidally 3-valved, the endocarp separating into 3 crustaceous or membranous cocci, opening by a broad operculum at the base of the inner face, or by the separation of the whole inner face, or rarely by a longitudinal slit. Seed inserted on a short, thickened, turbinated or cup-shaped funiculus.—Shrubs, with the young branches and under side of the leaves white, hoary or rusty with a close stellate tomentum, often mixed with or concealed by longer, simple, soft, often silky hairs. Leaves alternate, penninerved. Stipules brown and scarious, usually very deciduous. Flowers pedicellate, in small umbel-like cymes, usually forming terminal panicles or corymbs, or rarely solitary in the axils of the leaves. Bracts brown and scarious, but so deciduous as to be seldom visible at the time of flowering.

The genus is confined to Australia and New Zealand; the Australian species are all endemic and from the eastern and southern districts, with the exception of two which are also found in New Zealand.

Flowers with petals.

Calyx-tube turbinate, at least half as long as the lobes. Cocci opening by an operculum below the middle.

Leaves mostly ovate-lanceolate, 2 to 3 in. long. Panicles many-flowered.

Leaves hoary or tomentose above, softly tomentose underneath.

Calyx about 2 lines long, very villous

Leaves glabrous or sparingly scabrous-pubescent above, densely ferruginous, tomentose underneath. Calyx 1 to 1½ lines long, softly hairy

Leaves somewhat coriaceous, glabrous above, very white underneath. Calyx 1½ lines long, silky-hairy

Leaves ovate, and obtuse or oblong-elliptical, often above 2 in. long, glabrous above, white underneath. Panicles many-flowered. Calyx 1 to 1½ lines, closely tomentose or hairy .

Leaves firm, rarely above 1 in. long. Panicles small and compact. Calyx of *P. elliptica*

Calyx-tube exceedingly short. Cocci opening by their whole inner face. Leaves small. Panicles compact.

Leaves broadly ovate or orbicular. Calyx hoary. Petals broad .

Leaves obovate or broadly oblong. Calyx silky. Petals very narrow

Leaves narrow-oblong. Calyx silky. Petals narrow

Flowers without petals.

Cymes rather loose, numerous in much-branched panicles.

Calyx stellate-tomentose or hoary, with a very short tube.

Leaves 2 to 4 in. long, irregularly crenate and rugose

Leaves 1 to 2 in. long, ashy-white, not rugose

Calyx softly hairy, with a turbinate tube.

Leaves mostly obtuse, scabrous above, often crenulate and rugose

Leaves mostly acute, smooth above, quite entire

Cymes condensed into heads, in oblong panicles. Calyx-tube very short

Cymes loose, few, in close corymbs. Leaves obocordate or bifid. Calyx-tube turbinate

Cymes loose, usually few-flowered, axillary, or in narrow, oblong, or raceme-like panicles. Calyx-tube very short.

Leaves ovate, obovate, or broadly oblong, flat.

Leaves thick, ½ to 1 in. long, white or cottony underneath .

Leaves ½ to 1 in. long, loosely pubescent and scarcely white underneath

Leaves under ¼ in., obovate, white underneath

Leaves linear or oblong, the margins revolute. Flowers very small and numerous

1. *P. lanigera*.

2. *P. ferruginea*.

3. *P. grandis*.

4. *P. elliptica*.

5. *P. phillyreoides*.

6. *P. vacciniifolia*.

7. *P. myrtilloides*.

8. *P. ledifolia*.

1. ***P. lanigera***, Sims, Bot. Mag. t. 1823. An erect branching shrub, nearly allied to *P. elliptica*, with which it is united by F. Mueller, differing chiefly in the leaves softly though minutely tomentose on the upper side, and the larger more villous flowers. Leaves oblong or ovate-lanceolate, the under side as well as the young branches clothed with a soft velvety tomentum often rust-coloured. Panicles often larger and less corymbose than in *P. elliptica*. Calyx about 2 lines long, very densely and softly hairy, the

turbinate tube about half as long as the lobes. Petals ovate, concave, on slender claws. Fruit as in *P. elliptica*, but larger and more hairy.—DC. Prod. ii. 33, excluding the var. β ; *Ceanothus laniger*, Andr. Bot. Rep. i. 569; *P. obscura*, Sieb. Pl. Exs.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, n. 216; rocky gullies near King's Fall, *A. Cunningham*; New England, *C. Stuart*; Hastings river, *Beckler*.

2. *P. ferruginea*, Sieb.; Fenzl, in Hueg. Enn. 21. Very near *P. elliptica*, and united with it by F. Mueller, having the leaves glabrous above, and the small flowers of that species, but the leaves are usually rather longer for their breadth and more acute, and the down of the under side is much more dense, velvety and usually ferruginous. The flowers are more numerous, the calyx more softly and densely hairy, and the petals usually narrower. The fruits are the same. Hook. f. Fl. Tasm. i. 76; *P. lanigera*, var. β , DC. Prod. ii. 33; *P. viridirufa*, Sieb. Pl. Exs.; *Ceanothus Wendlandianus*, Rurm. and Schult. Syst. v. 299 (from the character given); *Pomaderris Wendlandiana*, G. Don, Gen. Syst. ii. 39.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, n. 209 and 214, and Fl. Mixt. n. 345; Parramatta, *A. Cunningham*, *Wools*; Blue Mountains, *Miss Atkinson*.

Victoria. Macalister river, Gipps' Land, *F. Mueller*.

Tasmania. Flinders Island, Bass's Straits, *Gunn*.

Var. *pubescens*. Leaves pubescent above with short scattered hairs, but green; flowers small, as in the normal form.—*P. hirta*, Reissek, in Endl. Nov. Stirp. Dec. 31 (from the description). Illawarra, Twofold Bay, and Genoa river, *F. Mueller*; and other localities in southern N. S. Wales and eastern Victoria.

Var. *canescens*. Leaves 3 to 4 in. long, white and less ferruginous underneath. Intermediate almost between *P. ferruginea* and *P. elliptica*.—Percy Island, *A. Cunningham*.

3. *P. grandis*, F. Muell. Fragm. iii. 68. Very nearly allied to *P. ferruginea*, and differing chiefly in the silvery whiteness of the tomentum. Leaves ovate-lanceolate or oblong-elliptical, rather acute, 2 to 3 in. long, glabrous above, silvery-white underneath, with a soft silky tomentum. Panicles many-flowered, corymbose, as in *P. ferruginea* and *P. elliptica*, and flowers about the same size. Calyx with a turbinate adnate tube, densely clothed with soft white silky hairs. Petals broad. Style-branches exceedingly short, but not shorter than in some N. S. Wales specimens of *P. elliptica*.

W. Australia. Mount Manypeak river, *Maxwell*. From the single specimen upon which this species is founded, it does not appear to me to differ more from *P. elliptica* than *P. ferruginea* and *P. phillyreoides*, and, if these are joined to it as varieties, *P. grandis* must surely follow, notwithstanding the distant habitat.

4. *P. elliptica*, Labill. Pl. Nov. Holl. i. 61, t. 86. A tall shrub or small tree, the young branches rusty with a very close stellate down, intermixed occasionally with a few longer hairs. Leaves petiolate, ovate, oblong or ovate-lanceolate, obtuse or rarely almost acute, usually 2 to 3 in. long and $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad, entire or the margins slightly waved, glabrous above and smooth or scarcely sebrous, white underneath with a very close tomentum, the prominent midrib and principal parallel veins often rust-coloured. Cymes numerous, in dichotomous panicles, usually more or less corymbose. Stipules lanceolate, brown and searious as well as the broad concave bracts, but all falling off in a very early stage so as to be rarely seen at the time of flowering. Calyx about $1\frac{1}{2}$ lines long, white with a minute stellate tomen-

tum, often intermixed with longer simple hairs, especially on the turbinate tube. Petals usually broadly cordate or nearly orbicular, concave, on slender claws, but often much narrower, sometimes deeply toothed and occasionally abortive. Style-branches short, with capitate stigmas. Capsule about $1\frac{1}{2}$ lines diameter, slightly hairy, the free part rather shorter than the adnate portion, the cocci opening in a round valve or operculum below the middle.—Bot. Mag. t. 1510; DC. Prod. ii. 33; Hook. f. Fl. Tasm. i. 76; F. Muell. Fragm. iii. 69.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; northward to New England, *C. Stuart*, and southward to Two-fold Bay, *F. Mueller*.

Victoria. Monkey Creek, Gipps' Land, *F. Mueller*.

Tasmania. Common, especially in the northern portion of the island, *J. D. Hooker*. Also in the northern island, New Zealand.

Two species are usually distinguished, *P. elliptica*, with broader more obtuse leaves and without any silky hairs mixed with the stellate tomentum of the calyx, and *P. discolor*, DC. Prod. ii. 33, Sweet, Pl. Aust. t. 41, with the calyx, at least the tube, more or less silky-hairy and the leaves often less obtuse. Labillardière's specimens belong to the former, but his description agrees better with the latter; and in many instances the two forms pass one into the other. Sieber's specimens, n. 208 (*P. malifolia*, Sieb.); *P. multiflora*, Venzl, in Hueg. Enum. 21), are very broad-leaved, with the tomentose calyx of the first form; n. 213 (*P. discolor*) belongs to the second; n. 210 (*P. intermedia*, Sieb.); DC. Prod. ii. 33) has the leaves narrower than usual and the indumentum of the calyx variable. *Ceanothus discolor*, Vent. Jard. Malm. t. 58, has the more acute leaves of the second form with the close tomentum of the first. *P. acuminata*, Link, Enum. Hort. Berol. 235, is probably established on the same garden-plant as Veutenat's.

F. Mueller considers *P. lanigera*, *ferruginea*, and *phillyreoides* as varieties only of this species, and it is certainly sometimes difficult to draw precise limits between them in the dried state. If they are united, the species should surely include also *P. grandis*.

5. **P. phillyreoides**, Sieb. in DC. Prod. ii. 33. A shrub, said to be of much smaller stature than *P. elliptica*. Down of the young branches sometimes very close and white or rusty, sometimes loose and more rusty, almost as in *P. ferruginea*. Leaves much smaller than in any of the preceding species, seldom attaining $1\frac{1}{2}$ in. and usually much shorter, oblong or oval, obtuse or acute, entire, of a firm consistence, glabrous or minutely hoary above, soft underneath with a white or rusty down. Flowers rather larger than in *P. elliptica*, but variable in size, the cymes compact, in small terminal panicles. Calyx softly silky-hairy, the turbinate tube shorter than the lobes. Petals nearly of *P. elliptica*, but usually narrower. Styles more deeply cleft, the branches club-shaped at the top, with somewhat decurrent stigmas. Capsule of *P. elliptica*.—*P. andromedæfolia*, A. Cunn. in Field, N. S. Wales, 351; Bot. Mag. t. 3219; *P. phillyreaefolia*, Fenzl, in Hueg. Enum. 22 (from the character given).

N. S. Wales. Port Jackson, Sieber, n. 215; rocks in the Blue Mountains and stony barren hilly districts, A. Cunningham and others. I have failed in identifying in R. Brown's herbarium the plant described by Fenzl, but have little doubt of its belonging to this species, which F. Mueller unites with *P. elliptica*.

Var. *nitidula*. Leaves more coriaceous, usually acute; tomentum closer, very white on the under side of the leaves.—New England, *C. Stuart*; Mount Lindsay, *W. Hill*.

6. **P. vacciniifolia**, Reissek and Muell. in Linnaea, xxix. 266. A shrub, with slender divaricate branches. Leaves ovate or nearly orbicular, very obtuse, seldom above $\frac{3}{4}$ in. long, glabrous above, white underneath. Cymes small, in ovoid terminal panicles of about 1 in. Buds nearly globular, about

1½ lines diameter, hoary with a very close stellate tomentum, without silky hairs, the calyx-tube exceedingly short. Petals broad. Summit of the ovary remarkably prominent, and hirsute with white hairs. Style-branches short, with capitate stigmas. Fruit nearly 1½ lines long, the free part much longer than the adnate base; cocci thin, opening by the separation of the whole inner face, which often splits along the centre.—F. Muell. *Fragm.* iii. 71.

Victoria. Watts river, F. Mueller.

7. **P. myrtilloides**, Fenzl, in *Hueg. Enum.* 22. Apparently a low, erect, dichotomous shrub, the tomentum of the younger branches and under side of the leaves very close but dense, and having a silky appearance on the younger leaves. Leaves from obovate to obovate-oblong, very obtuse or almost acute, slightly emarginate, mostly about $\frac{1}{2}$ in. long, in the original specimens narrowed at the base, glabrous above and quite entire. Cymes few, loose, forming small terminal corymbs, shorter or but little longer than the last leaves. Buds ovoid, or at length nearly globular. Calyx 1½ lines long, very silky with short hairs, the tube very short. Petals narrow-linear. Style almost entire. Fruit not seen.

W. Australia. Goose Island Bay, S. coast, R. Brown.

Var. *major*. Leaves larger, often 1 in. long; flowers larger.—*P. stenopetala*, F. Muell. *Fragm.* iii. 69. Point Henry, Oldfield.

8. **P. ledifolia**, A. Conn. in *Field, N.S. Wales*, 351. A slender and apparently a low shrub, the tomentum of the younger branches white and very close, and soon disappearing. Leaves narrow-oblong, obtuse, mostly about $\frac{1}{2}$ in. long, coriaceous, quite entire, glabrous above, the margins slightly recurved, white underneath, with the midrib alone prominent. Flowers few, in little loose shortly pedunculate cymes in the upper axils. Buds ovoid, about 1 line long, silky-hairy. Calyx-tube exceedingly short. Petals narrow, slightly concave. Styles rather short, free almost to the base. Ovary very hairy. Capsule ovoid, nearly glabrous, fully 1 line long, the free part much longer than the adnate tube, very obtuse and depressed or umbilicate at the top. Coccoi opening by the separation of the whole inner face, which often splits also along the centre.—*Trymalium helianthemifolium*, Reissek, in *Linnaea*, xxix. 271.

N. S. Wales. Rocky hills near Cox's river, A. Cunningham.

Victoria. Avon river, Gipps' Land, F. Mueller (only seen in fruit).

Var. (?) *angustifolia*. Leaves narrower, sprinkled on the upper side with stellate hairs.—Macalister river, F. Mueller. The foliage in some measure comes near to that of *P. phyllicifolia*, but the capsule is that of *P. ledifolia*. Flowers not seen.

9. **P. apetala**, Labill. *Pl. Nov. Holl.* i. 62, t. 87. A shrub of 3 to 6 feet, the stellate tomentum of the young branches and under side of the leaves usually dense, but close, sometimes however loose and floccose. Leaves petiolate, ovate-lanceolate or broadly oblong, obtuse or rarely acute, 2 to 4 in. long, irregularly crenulate, glabrous, but rough and much wrinkled on the upper side, the principal veins very prominent underneath. Flowers small and very numerous, in loose oblong thyrsoid panicles, leafy at the base. Buds ovoid or nearly globular. Calyx 1½ lines long, with stellate hairs, the tube very short. Petals none. Anthers tipped by a small gland. Styles divided to the middle, with club-shaped almost capitate stigmas. Capsule obtuse,

with a few stellate hairs; cocci opening with a short valve, as in *P. elliptica*.—Hook. f. Fl. Tasm. i. 77; F. Muell. Fragm. iii. 73; *P. aspera*, Sieb. in DC. Prod. ii. 33; A. DC. Pl. Rar. Jard. Gen. 5^o Not. 18, t. 4.

N. S. Wales. Nepean river, *R. Brown*; Port Jackson, *Sieber*, n. 211, and others; abundant in open forest-lands south of the colony, *A. Cunningham*; Twofold Bay, *F. Mueller*.

Victoria. King's Island and Port Phillip, *R. Brown*; extending over the southern and eastern districts of the colony, *F. Mueller*.

Tasmania. Abundant throughout the island, *J. D. Hooker*.

S. Australia. Kangaroo Island, *Waterhouse*; specimens in leaf only, and therefore doubtful.

The species varies much in the quantity of stellate tomentum, and also in the size of the flowers, but does not appear to be separable into distinct varieties.

10. **P. cinerea**, Benth. A tall shrub, with numerous slender branches, hoary with a minute tomentum. Stipules filiform. Leaves ovate or elliptical, obtuse or scarcely acute, 1 to nearly 2 in. long, quite entire, hoary above and white underneath with a close minute tomentum, the primary veins prominent underneath, but not impressed above. Cymes loose, many-flowered, in terminal leafy panicles. Bracts narrow, falling off very early, as in the rest of the genus. Buds small, globular, white-tomentose, not yet quite open in the specimens seen. Calyx-tube exceedingly short. Petals none.

N. S. Wales. Mount Imlay, Twofold Bay, *F. Mueller*.

11. **P. prunifolia**, A. Cunn.; Fenzl, in Hueg. Enum. 22. Stellate tomentum of the branches and under side of the leaves dense and white, or sometimes ferruginous. Leaves ovate or oblong, obtuse or mucronate, seldom above 1½ in. long, wrinkled, and often pubescent above, with short, simple or stellate hairs. Flowers small and numerous, in many-flowered compact cymes, arranged in thyrsoid terminal panicles as in *P. ligustrina*. Calyx obovoid, about 1 line long, the tube turbinate, the stellate tomentum usually concealed by long silky hairs. Petals none. Styles cleft nearly to the base. Capsule about 1 line diameter, hirsute, obtuse, only slightly protruding from the adnate tube of the calyx.—F. Muell. Fragm. iii. 75.

N. S. Wales. Near Liverpool, *A. Cunningham*; Paramatta, *Woolss*. In some herbaria Cunningham's labels of this and *P. betulina* are interchanged.

Victoria. Genoa river and coast near Snowy River, *F. Mueller*. (Leaves almost smooth above. Capsule rather more prominent.)

12. **P. ligustrina**, Sieb. in DC. Prod. ii. 34. Branches slender, the tomentum soft and rust-coloured. Leaves lanceolate or ovate-lanceolate, 1 to 2 in. long, glabrous above, quite entire, rusty-tomentose or almost woolly underneath. Flowers small and numerous, in rather loose thyrsoid terminal panicles. Calyx obovoid, scarcely above 1 line long, softly silky-hairy. Petals none. Styles usually divided to the middle, with club-shaped stigmas. Capsule about 1 line diameter, hirsute, rather obtuse, the exserted part about as long as the adnate tube; operculum of the cocci about half their length.—F. Muell. Fragm. iii. 71.

N. S. Wales. Port Jackson, *Sieber*, n. 212, and *Fl. Mex.* n. 544, and others; Blue Mountains, *A. Cunningham*; northward to Hastings river, *Beckler*; southward to Twofold Bay, *F. Mueller*.

13. **P. betulina**, A. Cunn. in *Bot. Mag.* t. 3212. A slender shrub or small tree, with elongated branches. Tomentum of the young branches and under side of the leaves often rust-coloured and usually close. Leaves oblong or obovate, obtuse, seldom above 1 in. long. Flowers nearly sessile, in dense globular heads, either solitary or more frequently two or three together, on short axillary or terminal peduncles. Bracts more persistent than in most species. Buds ovoid-globular. Calyx about 1 line long, densely clothed with long silky hairs. Petals none. Style cleft to the middle with club-shaped branches, stigmatic some way down.—F. Muell. *Fragm.* iii. 76.

N. S. Wales. In a water-gully at the base of the Pine Ridge, Macquarie river, A. Cunningham.

Victoria. Gravelly rocky banks of the Upper Genoa river, F. Mueller.

The foliage of this species is not unlike that of *P. prunifolia*, but the inflorescence is very different.

14. **P. obcordata**, Fenzl, in *Hueg. Encycl.* 23. A low much-branched shrub, the young branches hoary with a minute tomentum. Leaves cuneate, obovate, or broadly 2-lobed at the top, with rounded entire or crenate lobes, rarely above $\frac{1}{2}$ in. long, and often much less, much contracted at the base, the margins usually recurved, pale-coloured, but glabrous above, much whiter underneath with a minute close tomentum. Flowers in loose cymes, forming small terminal corymbs, of about $\frac{1}{2}$ in. diameter or rather more. Bracts rather large, but very deciduous, as in other species. Calyx fully 1 line long, slightly hoary. Petals none, in our specimens. Stamens long, with oblong anthers. Disk slightly prominent. Style 3-cleft to the middle. Fruit ovoid, nearly 2 lines long, the exserted part stellate-tomentose and rather longer than the adnate base. Coccii slightly wrinkled on the inner face, indehiscent or opening by the whole inner face, or sometimes in two valves.—*Trymalium bilobatum*, F. Muell., Reissek, in *Linnæa*, xxix. 279; *T. biauritum*, Reissek, and Muell. l. c. 281; *Pomaderris biaurita*, F. Muell. *Fragm.* iii. 73, and *Pl. Vict.* ii. t. 22.

S. Australia. Memory Cove, R. Brown; dry hills on the Glenelg and thence to Gnichen Bay, F. Mueller; Port Lincoln, *Wilhelmi*; Spencer's Gulf, Warburton.

W. Australia. King George's Sound, M'Lean.

This species in some measure connects *Pomaderris* with *Trymalium*, but both the inflorescence and flowers are much more those of the former genus than of *Trymalium*, especially if they are really apetalous, as I find them in all the specimens I have examined, although Reissek describes broadly hood-shaped petals with slender claws.

15. **P. racemosa**, Hook. *Journ. Bot.* i. 256. A small much-branched shrub, the stems and under side of the leaves covered with stellate tomentum, sometimes short and close, but often copious or loose and floccose, white or of a deep rust-colour. Leaves small, seldom exceeding an inch, and often not above $\frac{1}{2}$ in., from broadly ovate to oblong or obovate, obtuse, entire or irregularly crenate. Flowers on very short pedicels, and generally few in each cyme, of which 3 to 6 form short compound racemes in the upper axils, and sometimes the whole inflorescence reduced to 5 or 6 flowers. Buds globular. Calyx 1 to $1\frac{1}{2}$ lines long, with stellate hairs. Petals none. Style cleft to the middle, with club-shaped branches stigmatic some way down.—Hook. f. Fl. Tasm. i. 77; F. Muell. *Fragm.* iii. 75.

N. S. Wales. Desert of the Darling and Murray, F. Mueller. (I have not seen these specimens.)

Victoria. Port Phillip, *R. Brown*; on the coast from Wilson's Promontory to the Murray, Buehan river in Gipps' Land and in the Murray desert, *F. Mueller*.

Tasmania. N. coast about the mouth of the Tamar, *Lawrence, Gunn, C. Stuart*.

S. Australia. Memory Cove, *R. Brown*; from the Murray river to Spencer's Gulf and inland to Lake Torrens, *F. Mueller*.

The species is very variable, the following being the three principal forms observed:—

a. Leaves very scabrous on the upper surface and rather large; flowers rather large and numerous.—*P. oraria*, *F. Muell.* and *Reissek*, in *Linnaea*, xxix. 268.

b. Leaves quite glabrous above; flowers rather large and few.

c. Leaves slightly stellate-downy above; flowers small and usually numerous.—*P. paniculosa*, *F. Muell.* and *Reissek*, in *Linnaea*, xxix. 269.

16. **P. subrepanda**, *F. Muell.*, *Reissek*, in *Linnaea*, xxix. 267. Branches slender, the tomentum of the young ones and under side of the leaves close, stellate, and white or rust-coloured. Leaves oval or oblong, seldom 1 in. long and usually $\frac{1}{2}$ to $\frac{3}{4}$ in. entire or slightly and irregularly toothed, glabrous above with impressed veins. Cymes few-flowered, often reduced to 1 or 2 flowers, in short loose thyrsoid compound racemes in the upper axils, forming oblong leafy terminal panicles. Buds globular. Calyx stellate-tomentose, about 1 line long, the tube very short. Petals none. Ovary very villous. Styles short, with almost capitate stigmas. Capsule ovoid, scarcely 1 line long, the free part longer than the adherent base. Coccii membranous, opening by a longitudinal slit, or at length by nearly the whole inner face.—*F. Muell.* *Fragn.* iii. 74.

Victoria. Yarra Yarra river and Forest Creek, *F. Mueller*. The foliage is very nearly that of some specimens of *P. pruinosum*, but the flowers and fruit are quite distinct.

17. **P. elachophylla**, *F. Muell.* *Fragn.* ii. 131. A tall shrub, with numerous slender divaricate branches, rather loosely stellate-tomentose. Leaves broadly obovate, very obtuse, rarely $\frac{1}{4}$ in. long, and often under 2 lines, entire, glabrous above or sprinkled with a few minute stellate hairs, white-tomentose underneath. Cymes few-flowered or reduced to 1 or 2 flowers in the upper axils of the smaller branches, forming loose leafy racemes or narrow thyrsoid panicles. Buds globular. Calyx stellate-tomentose, about $\frac{1}{2}$ line long, the tube very short. Petals none. Styles short, club-shaped. Young capsule hairy, the free part much longer than the adnate calyx-tube.

Victoria. On the river Tyers, an affluent of the Latrobe river, *F. Mueller*; Upper Yarra river, *E. B. Heyne*.

18. **P. phyllicifolia**, *Lodd.* *Bot. Cab.* t. 120. A heath-like shrub with numerous erect branches, densely villous or rarely only stellate-downy. Leaves linear or narrow-oblong, nearly sessile, seldom above $\frac{1}{2}$ in. long, the margins usually much revolute so as often to conceal the under surface, which bears a close white tomentum, whilst the upper side is more or less scabrous with short simple or stellate hairs; more rarely the leaves are broader and nearly flat. Flowers small and few, in little loose cymes in the upper axils, scarcely longer than the leaves, but very abundant along the smaller branches, and the upper ones forming thyrsoid leafy panicles. Calyx globular, densely pubescent or villous, scarcely 1 line diameter. Petals none. Capsule ovoid, hirsute, about 1 line long, scarcely obtuse, the free part longer than the adnate base. Coccii membranous, opening by the whole inner face.—*DC.* *Prod.* ii. 34; *P. ericifolia*, *Hook.* *Journ. Bot.* i. 257; *Hook. f. Fl.*

Tasm. i. 78; Reissek, in Linnaea, xxix. 270; *P. polifolia*, Reissek, in Linnaea, xxix. 269.

Victoria. Banks of subalpine streams under the Australian Alps, descending into the plains of Gipps' Land on the Hume and Murray rivers, *F. Mueller*.

Tasmania. Mersey river, *Gunn*; St. Paul's river, *C. Stuart*.

Found also abundantly in the northern island of New Zealand. Some specimens of *P. ledifolia* come near to this species in habit, but they may be readily known when in flower by the petals, and in fruit by the very truncate or depressed apex of the capsule.

Var. *latifolia*. Leaves oblong, $\frac{1}{2}$ to 1 in. long, the margins scarcely revolute.—Genoa river in Victoria, *F. Mueller*.

8. TRYMALIUM, Fenzl.

Calyx-tube entirely adnate to the ovary, the limb divided to the base into 5 lobes, usually deciduous or spreading. Petals 5, hood-shaped, entire or 3-lobed, but not usually enclosing the anthers. Stamens 5, the filaments rather short, incurved, with small, ovoid anthers. Disk annular or divided into 5 glands, surrounding the ovary at the base of the calyx-lobes. Ovary half-inferior or almost entirely inferior, 3- or rarely 2-celled. Style 3-cleft or rarely 2-cleft at the top or to the middle. Capsule protruding above the adnate calyx-tube or rarely on a level with it, the endocarp separating into crustaceous or rarely membranous cocci, indehiscent or open internally in 2 valves. Seeds of *Pomaderris*.—Shrubs, with the habit and deciduous sti-pules and bracts of *Pomaderris*, but with smaller flowers and a more slender inflorescence, the panicles usually narrow, or the cymes few-flowered. Flowers always pedicellate.

The species are all confined to West Australia.

Panicles or racemes elongated, terminal, or longer than the leaves.

Leaves ovate or broadly oblong, flat.

Leaves hoary on the upper side with a minute tomentum 1. *T. albicans*.

Leaves glabrous above, or hirsute 2. *T. Billardieri*.

Leaves linear-oblong or linear, the margins revolute 3. *T. ledifolium*.

Cymes few-flowered, shorter than or scarcely exceeding the leaves.

Leaves linear. Ovary 3-celled.

Petals entire. 3. *T. ledifolium*.

Petals 3-lobed 4. *T. angustifolium*.

Leaves cuneate, hoary on both sides. Ovary 2-celled 5. *T. Wichurae*.

1. **T. albicans**, Reissek, in *Pl. Preiss.* ii. 280. Apparently a tall shrub, the branches white or hoary with a close stellate tomentum. Leaves broadly ovate or obovate, very obtuse, 1 to 2 in. long, soft and more or less hoary on the upper side, white underneath with a minute down. Flowers in thyrsoid terminal panicles, larger and fewer than in *T. Billardieri*. Calyx fully 1 line long, white with a close tomentum. Capsule very obtuse, $1\frac{1}{2}$ lines in diameter, the broad stellately pubescent exserted portion as long as the turbinate adnate base; cocci crustaceous, muricate or wrinkled on the inner face, apparently indehiscent.—*Pomaderris albicans*, Steud. in *Pl. Preiss.* i. 184.

2. **T. Australia**, Swan River, Drummond, 5th Coll. n. 229; sides of Mount Eliza, Preiss, n. 1689.

2. **T. Billardieri**, Fenzl, in *Hueg. Enum.* 25. A tall shrub, the young branches hoary with stellate hairs and often villous with simple ones. Leaves

sometimes broadly ovate or obovate, very obtuse, 1 to 2 in. long, sometimes ovate or ovate-lanceolate, more or less acuminate, 2 to 3 in. long, entire or with a few coarse crenulations, glabrous or pubescent above, white or hoary, or, in the hirsute variety, villosus underneath. Flowers numerous, in loose narrow terminal panicles, sometimes almost racemiform and 2 to 3 in. long, more frequently forming compound leafy panicles of $\frac{1}{2}$ ft. or more. Bracts very small. Pedicels very slender. Calyx less than 1 line long, the tube very short and densely pubescent. Capsule very obtuse, stellate-pubescent, the broad exserted portion longer than the adnate tube; cocci indehiscent, the inner face very rugose.—Reissek, in *Pl. Preiss.* ii. 282; *Cranothos squamulatus*, Labill. *Pl. Nov. Holl.* i. 60, t. 84; *Pomaderris spinulata*, G. Don, *Gen. Syst.* ii. 38; *T. floribundum*, Steud. in *Pl. Preiss.* i. 185.

W. Australia. Swan River, *Dreamland*; in stony rocky places, *Preiss.* n. 1680; King George's Sound, *R. Brown* and others, Harvey and Blackwood rivers, *Oldfield*; Mount Manypeak river, *Maxwell*.

Var. *hirsutum*, Reissek, in *Pl. Preiss.* ii. 282. Branches, and often the leaves also, hirsute and scarcely white underneath. Some specimens have so different an aspect from the typical form that they seem to indicate a distinct species, but the two are connected by numerous intermediates.—*T. expansum*, Steud. in *Pl. Preiss.* i. 185. King George's Sound, *R. Brown*; Kadgan river, *Oldfield*; Todyay valley, Victoria district, *Preiss.* n. 1683 (*ib.* *R. Brown*, *Sonder*, *F. Muell.*).

3. **T. ledifolium**, Fenzl, in *Hueg. Enum.* 24. A low shrub, with slender branches, with a slight stellate tomentum. Leaves linear or sometimes linear-lanceolate or oblong, from $\frac{1}{2}$ to 1 in. long, the margins more or less revolute, glabrous above, hoary or sometimes very white underneath, with a very prominent midrib. Panicles slender and raceme-like, usually 1 to 2 in. long and terminal, but sometimes scarcely longer than the leaves and on short lateral shoots so as to appear lateral, the rachis slightly tomentose. Bracts small and very deciduous. Buds globular. Calyx little more than $\frac{1}{2}$ line long, usually very tomentose or pubescent, especially the tube, and the ovary and disk pubescent, but sometimes the whole flower quite glabrous. Style short. Capsule ovoid, truncate at the top, in the normal form not projecting beyond the adnate calyx-tube, and usually crowned by the persistent calyx-lobes. Coccii crustaceous, much wrinkled on the inner face.—Reissek, in *Pl. Preiss.* ii. 282.

W. Australia. King George's Sound, *R. Brown*; Swan River, *Dreamland*, 1st Coll., *Oldfield*; Blackwood and Vasse rivers and Darling range, *Oldfield*.

Var. *rosmarinifolium*. Leaves usually narrow and much revolute; capsule protruding considerably beyond the adnate calyx-tube.—*Pomaderris rosmarinifolia*, Steud. in *Pl. Preiss.* i. 184; *Cryptandra floribunda*, Steud. l. c. 186; *C. glaucescens*, Steud. l. c. i. 187; *Trymalium rosmarinifolium*, Reissek, in *Pl. Preiss.* ii. 283. Swan River, *Dreamland*, *Preiss.* n. 1674, 1675, and 1684.

Var. *daphnifolium*. Leaves rather short, oblong, the margins less revolute than in the normal form; capsule protruding considerably beyond the adnate calyx-tube. *T. daphnifolium*, Reissek, in *Pl. Preiss.* ii. 283. Swan River, *Dreamland*, 5th Coll. n. 237; between Perth and King George's Sound, *Harvey*.

Var. *obovatum*. Leaves obovate or obovate-oblong, flat. Rocks at Todyay, *Oldfield*. The specimens are small and in bud only, the petals appear to be broader than usual.

Cr. plaudra anomala, Steud. in *Pl. Preiss.* i. 187, appears also to be a variety of *T. ledifolium*.

4. **T. angustifolium**, Reissek, in *Pl. Preiss.* ii. 284. An apparently

low heath-like shrub, with erect twiggy branches, hoary with short stiff hairs. Leaves linear, mostly 3 to 4 lines long, the margins much revolute, hispid with stiff hairs, hoary or silky underneath. Flowers very small, in axillary cymes, forming short, dense, terminal, raceme-like leafy panicles of $\frac{1}{2}$ to 1 in. Bracts minute. Pedicels short. Calyx-tube very hairy. Petals rather shorter than the calyx-lobes, with a lateral concave lobe on each side almost as large as the central one, and contracted below the lobes into a short claw. Disk annular. Capsule $1\frac{1}{2}$ to $1\frac{1}{2}$ lines diameter, globular, very hispid and acuminate with the persistent base of the style. Coccii almost membranous, apparently indehiscent.

W. Australia. Swan River, *Drummond*, 1st Coll.

5. T. Wichuræ, Nees; *Reissek*, in *Pl. Preiss.* ii. 281. A much-branched slender shrub, the young branches and both sides of the leaves hoary with a minute close tomentum. Leaves obovate-cuneate or spatulate, very obtuse or rarely emarginate, 2 to 4 lines long, much contracted at the base. Flowers very small, 2 to 4 together in little terminal cymes. Calyx about $\frac{1}{4}$ line long, minutely hoary. Disk prominent. Petals small, hood-shaped, entire. Ovary 2-celled. Style minutely 2-lobed at the top. Capsule obovoid, $1\frac{1}{2}$ lines long, the exserted portion very obtuse and shorter than the adnate tube, splitting to the base into 2 valves, the 2 coccii opening in 2 valves.

W. Australia, Swan River, *Drummond*; between Perth and King George's Sound, *Harvey*; King George's Sound, Wilson's River, and Hay Inlet, *Maxwell*.

9. SPYRIDIUM, Fenzl.

(*Stenodiscus*, *Reissek*.)

Calyx-tube entirely adnate or shortly free above the ovary, but not above the disk, the limb divided to the disk into 5 usually persistent lobes. Petals 5, hood-shaped, usually enclosing the anthers. Stamens 5; filaments short; anthers small, ovoid. Disk annular or divided into 5 glands, either close round the ovary and filling the calyx-tube, or lining the calyx-tube when produced above the ovary. Ovary wholly inferior, 3-celled. Style entire or minutely 3-toothed. Capsule enclosed in the calyx-tube and crowned by the persistent lobes, 3-valved at the top, the endocarp separating into 3, sometimes reduced to 2 or 1, membranous or rarely crustaceous coccii, either indehiscent or opening inwards by a longitudinal slit. Seeds of *Ponaderris*.—Shrubs, with the indumentum of *Ponaderris*. Leaves usually small. Stipules scarious, brown, lanceolate, usually connate and persistent. Flowers sessile in heads or rarely solitary, surrounded by small, persistent, imbricate, brown scarious bracts, the heads small, sessile, usually several together in a compound head or in corymbose cymes, the outer heads in each having often a floral leaf, either like the stem-leaves, or smaller and broader, on a longer petiole and whiter, the head having the appearance of being inserted on the petiole.

The genus is entirely Australian and extratropical. It differs from *Trymalium* chiefly in inflorescence and habit, from *Stenanthenium* and *Cryptandra* in the calyx-tube not produced above the disk.

§1. Heads very small and few-flowered, sessile along the branches, with very minute bracts. Leaves orbicular.
 Leaves 2 to 5 lines long, hoary on both sides 1. *S. tridentatum*.
 Leaves 1 to 2 lines long, glabrous above, white underneath 2. *S. divaricatum*.

§2. Heads several-flowered in cymes or compound heads, usually with one or more floral leaves. Leaves obovate, orbicular-ovate, or broadly oblong.
 Disk annular, or of 5 glands close upon the ovary or nearly so.
 Flower-heads in cymes, except in some of the last species, where they are in compound heads.
 Leaves herbaceous, pubescent or glabrous above.
 Leaves obovate, orbicular, or cuneate, mostly 2 to 3 lines long, glabrous above, the veins not impressed 3. *S. serpyllaceum*.
 Leaves ovate, 3 to 6 lines or sometimes above 1 in. long, hoary or softly pubescent, or rarely glabrous above.
 Disk very prominent, almost closing over the ovary 4. *S. parvifolium*.
 Disk slightly prominent, of 5 distinct glands 5. *S. spadiceum*.
 Leaves coriaceous, glabrous and smooth above when full-grown.
 Leaves mostly 1 to 1½ in. long, ovate, on rather long petioles. Heads numerous, in the cyme. Floral leaves rare. Plant generally canescent 6. *S. globulosum*.
 Leaves mostly ½ to ¾ in., on short petioles. Cymes small, with 3 or 4 floral leaves. Tomentum rusty or very white.
 Leaves obovate or oblong, contracted at the base 7. *S. obovatum*.
 Leaves ovate, obtuse at the base 8. *S. Gunnii*.
 Leaves rarely attaining 1 in.
 Leaves cuneate-ovate or spatulate, silky underneath 9. *S. spatulatum*.
 Leaves small, broad, much revolute, smooth above, woolly underneath.
 Leaves orbicular or obovate. Flower-heads very villous 10. *S. Lawrencii*.
 Leaves broadly cordate. Flowers glabrous at the top 11. *S. cordatum*.
 Leaves ovate or obovate, with raised reticulations above, silky underneath 12. *S. phlebophyllum*.
 Disk lining the calyx-tube above the ovary, with a thickened annular margin under the lobes. Flower-heads in compound compact heads. Leaves under ½ in.
 Leaves obtuse at the base, often emarginate 13. *S. coactilifolium*.
 Leaves obovate, narrowed at the base, folded lengthwise. Flower-heads globular 14. *S. complicatum*.

§3. Heads several-flowered, in cymes or compound heads, usually with one or more floral leaves. Leaves linear, linear-oblong, narrow-cuneate or 2-lobed, the margins usually revolute.
 Flower-heads small, in cymes. Disk of 5 distinct glands.
 Leaves entire.
 Leaves glabrous above, silky underneath. Branches tomentose. Cymes little branched 15. *S. westringiaefolium*.
 Tomentum hoary, mixed with long hairs. Cymes much branched 16. *S. villosum*.
 Tomentum hoary or white. Cymes small, few-headed 17. *S. pauciflorum*.
 Flower-heads united into one dense compound head.
 Leaves shortly 2-lobed. Disk dividing into distinct glands.
 Leaves cuneate, very pubescent 18. *S. halmaturinum*.
 Leaves linear, minutely tomentose or glabrous 19. *S. bijidum*.
 Leaves entire. Disk undulate or entire.
 Calyx glabrous, very small. 24. *S. microcephalum*.

Calyx tomentose or hirsute, at least the tube.

Stipules on the young shoots large. Calyx 1 to $1\frac{1}{2}$ lines long. Disk prominent, annular, close to the ovary.

Leaves tomentose or hoary on both sides, rarely glabrous above when old 20. *S. subochreatum*.

Leaves glabrous above, very narrow 21. *S. oligocephalum*.

Stipules small. Calyx under 1 line. Leaves usually glabrous above.

Floral leaves usually ovate, more petiolate than the stem-leaves. Disk annular, close on the ovary 22. *S. vexilliferum*.

Floral leaves like the stem-leaves. Disk lining the calyx-tube with a thickened annular margin raised above the ovary 23. *S. eriocephalum*.

§ 4. Flowers solitary or 3 together, each with separate bracts. Disk lining the calyx-tube, the thickened annular margin under the calyx-lobes far above the ovary. Leaves linear, the margins revolute (*Stenodiscus*, Reissek) 25. *S. ulicinum*.

1. ***S. tridentatum*, Benth.** Branches slender, wiry, slightly pubescent. Leaves obovate, obcordate, or triangular, truncate or 3-toothed at the top, narrowed at the base, 2 to 4 lines long, the margins not recurved, but the leaf sometimes conduplicate as in *S. complicatum* or in *Stenanthemum*, usually hoary on both sides with a minute close tomentum, or clothed with longer appressed hairs underneath. Flowers very small, in small lateral heads, sessile among a few floral leaves, the brown bracts narrow and much smaller than in any other species. Calyx not 1 line long, hoary-tomentose. Disk annular, close round the ovary. Capsule ovoid, nearly $1\frac{1}{2}$ lines long, crowned by the calyx-lobes. Coccii almost crustaceous, opening inwards in 2 valves.—*Cryptandra tridentata*, Steud. in Pl. Preiss. i. 186; Reissek, in Pl. Preiss. ii. 289; *Stenanthemum tridentatum*, Reissek, in Linnaea, xxix. 295.

W. Australia. Swan River, Preiss, n. 1216 and 2421, Between Perth and King George's Sound, Harvey; Murchison river and Champion Bay, Oldfield.

This species was placed by Reissek in *Stenanthemum*, but the calyx has not the slender tube produced above the disk and ovary which characterizes that genus.

2. ***S. divaricatum*, Benth.** A low, divaricately-branched, often spiny shrub, the branches nearly glabrous, slender but rigid. Leaves in little clusters along the branches, 1 to 2 lines long, obcordate or obtusely 2-lobed, narrowed at the base, the margins revolute, glabrous and smooth above, white underneath. Flowers very minute, 2 or 3 together in the clusters of leaves, with small imbricate acuminate bracts. Calyx little more than $\frac{1}{2}$ line long, the short tube pubescent, the lobes glabrous. Disk annular, close round the ovary.

W. Australia. Dirk Hartog's Island, Milne; Murchison river, Oldfield.

3. ***S. serpyllaceum*, F. Muell. Fragm. iii. 80.** Branches numerous, prostrate, slender and wiry, the young ones minutely tomentose, but soon glabrous. Leaves obovate or obcordate, very obtuse, 2 to 3 or rarely 4 to 5 lines long, the margins recurved, glabrous or slightly tomentose above, with the veins slightly impressed, hoary or white underneath. Flowers in small very compact heads, forming small leafy cymes, the imbricate brown bracts almost as long as the calyx. Calyx about 1 line long, densely tomentose. Disk slightly raised above the ovary, lining the short tube and forming a ring under the lobes. Coccii membranous.—*Cryptandra obcordata*, Hook. f. Fl. Tasm. i. 71; *Trymaliun serpyllaceum*, Reissek, in Linnaea, xxix. 280.

Victoria. Entrance of the Genoa river, *F. Mueller*.

Tasmania. Trap hills on the banks of the Tamar, and abundant on the Asbestos hills, *Gunn, J. D. Hooker*.

4. **S. parvifolium**, *F. Muell. Fragm.* iii. 79. Much-branched and rather slender, with a dense close tomentum or with a loose and more spreading pubescence, varying from hoary to a more or less rusty tint. Leaves obovate or orbicular, very obtuse or emarginate, seldom in the ordinary form above $\frac{1}{2}$ in. and often not above 3 lines long, the margin usually recurved, soft and often hoary on the upper side, with the primary veins much impressed, softly hoary underneath, with the veins prominent. Flowers closely sessile in little heads, forming small dense terminal leafy cymes, and closely surrounded by the short brown imbricate bracts. Calyx very hirsute, about 1 line long. Disk very prominent over the ovary, almost concealing it. Capsule wholly inferior. Coccæ crustaceous, slightly rugose on the inner face, indehiscent or opening tardily in 2 valves. — *Pomaderris parvifolia*, Hook. *Journ. Bot.* i. 257; Schlecht. *Linnaea*, xx. 636; *Cryptandra parvifolia*, Hook. f. *Fl. Tasm.* i. 73; *Trymalium parvifolium* and *T. hermannioides*, Reissek, in *Linnaea*, xxix. 275.

N. S. Wales. Twofold Bay, *F. Mueller*.

Victoria. Frequent in rocky, stony, and scrubby places, *F. Mueller*. In Mitchell's collections under the name of *T. majorifolium*, Lindl., but not Fenzl's species of that name.

Tasmania. N. coast, banks of the Tamar, and islands of Bass's Straits, *Gunn* and others.

S. Australia. Mouth of the Glenelg, *Attitt*; extending to Barossa ranges and St. Vincent's Gulf, *F. Mueller*.

Var. *mollis*. —Softly hairy all over. — *Cryptandra mollis*, Hook. f. *Fl. Tasm.* i. 73. Flinders Island and Cape Barren Island, *Gunn*.

Var. *hirsutissimum*, very hispid all over. —In the Grampians, *Wilhelmi*.

Var. *grande*, *F. Muell.* Luxuriant, the leaves often above 1 in. long, and cymes loose and many-headed, thus assuming the aspect of *S. spadiceum*, but with the prominent disk of *S. parvifolium*. — *Trymalium eupatorioides*, Reissek, in *Linnaea*, xxix. 270, Dandenong in Victoria, *F. Mueller*.

5. **S. spadiceum**, *Benth.* Branches clothed with a soft but close often rusty tomentum, with more or less of soft spreading hairs. Leaves in the original form from narrow-oblong to nearly oval, obtuse, 1 to $1\frac{1}{2}$ in. long, or $\frac{1}{2}$ in. on the lateral branches, softly and minutely pubescent above, white underneath or the veins rusty. Flower-heads crowded in compact broad cymes, usually shorter than the leaves. Brown bracts broad and numerous. Calyx scarcely 1 line long, the tube very hairy. Petal-claws slender. Style short. Disk of distinct glands, alternating with the stamens and very slightly raised above the ovary. Capsule nearly $1\frac{1}{2}$ lines long, crowned by the calyx-lobes. Coccæ rather coriaceous, opening inside in 2 valves. — *Trymalium spadiceum*, Fenzl, in *Hueg. Enum.* 26; Reissek, in *Fl. Preiss.* ii. 280; *Pomaderris hirsuta*, Steud. in *Fl. Preiss.* i. 181; *Trymalium thomasoides*, Turez. in *Bull. Mosc.* 1858, i. 459.

W. Australia. King George's Sound, *Huogel*; southern districts, *Drummond*, n. 231; rocky places at the back of Mount Clarence, *Preiss.* n. 1673 a, *Oldfield*.

Var. *majorifolium*. A smaller plant. Leaves usually under $\frac{1}{2}$ in. long, rather more coriaceous than in the ordinary form, hoary on both sides with a close soft tomentum. Flower-heads small, in small compact cymes. Disk separating into 5 glands close to the

ovary. Coccii membranous.—*Trymalium majorianum folium*, Fenzl, in Hueg. Enum. 21; Reissek, in Pl. Preiss. ii. 281; *Pomaderis commixta*, Steud. in Pl. Preiss. i. 184. King George's Sound, *R. Brown*, and others; Mount Clarence, *Preiss*, n. 1673 b. Usually a very marked form, but some specimens seem to pass into the larger variety.

Var. (?) *calvescens*, Reissek, in Pl. Preiss. ii. 28. Leaves glabrous above, or nearly so, usually small, of a firmer consistence, almost like those of *S. obovatum* and *S. Gunnii*, but the flowers are much smaller and the disk different.—*Pomaderis subretusa*, Steud. in Pl. Preiss. i. 183.—King George's Sound, *R. Brown*; Mount Baldhead, *Preiss*, n. 1687; Princess Royal Harbour, *Maxwell*.

The species, although sometimes approaching *S. parvifolium* in habit, is readily known by the disk.

6. ***S. globulosum*, Benth.** A tall shrub, with larger leaves and more of the appearance of a *Pomaderis* than most *Spriadia*, generally hoary with a minute very close tomentum. Leaves ovate, obovate or oblong, very obtuse, 1 to 1½ or rarely 2 in. long, almost coriaceous, glabrous above, white or hoary underneath, or rarely slightly rusty. Flower-heads nearly globular, numerous in dense corymbose cymes in the axils of the leaves and not much exceeding them. Brown bracts pubescent, shorter than the calyx. Calyx pubescent or silky-villous, about 1 line long, broadly campanulate. Disk of 5 distinct glands, close round the ovary. Capsule scarcely 1½ lines long, the pubescent convex summit slightly protruding from the calyx-tube, but covered by the persistent segments. Coccii membranous. *Ceanothus globulosus*, Labill. Pl. Nov. Holl. i. 61, t. 85; *Pomaderis globulosa*, G. Don, in Loud. Hort. Brit. 84, and Gen. Syst. ii. 35; *Trymalium globulosum*, Fenzl, in Hueg. Enum. 25; Reissek, in Pl. Preiss. ii. 279; *Pomaderis polyantha* and *P. annula*, Steud. in Pl. Preiss. i. 182; *P. phillyroæfolia* and *P. pyrrhophylla*, Steud. i. c. 183.

W. Australia. Common about King George's Sound, *Lathurdire*, *R. Brown*, and others, and thence along the coast to Vasse river and Swan River, *Drummond*, *Oldfield*, *Preiss*, n. 1676, 1677, 1678, 1679, 1681, 1690, and others.

7. ***S. obovatum*, Benth.** Apparently a low and much-branched shrub, the stellate tomentum usually somewhat rust-coloured. Leaves obovate or oblong, very obtuse or slightly emarginate, seldom exceeding ½ in., the margin recurved, firm and coriaceous, usually smooth and shining above, with the primary veins impressed, softly but closely tomentose underneath. Flower-heads small, in terminal cymes, with 1 to 3 floral leaves. Bracts orbicular. Calyx 1 line long, the tube hairy, the lobes glabrous or rarely hirsute. Petal-claws slender. Disk prominent, undulate, close round the ovary.—*Pomaderis obovata*, Hook. Comp. Bot. Mag. i. 277; *Cryptandra obovata*, Hook. f. Fl. Tasm. i. 74; *Trymalium obovatum*, Reissek, in Linnaea, xxix. 278.

Tasmania. Common on the east coast, *Gum* and others. Some *S. Australian* broad-leaved forms of *S. verilliferum* appear to come very near to this species.

Var. *velutinum*. Leaves minutely and softly tomentose on the upper side.—*Trymalium velutinum*, Reissek, in Linnaea, xxix. 276.—*Tasmania*, *C. Stuart*.

***S. Gunnii*, Benth.** Very near *S. obovatum*, and the leaves have the same coriaceous texture, but they are rather larger, mostly above ½ in. long and more ovate or oval than obovate, glabrous or rarely tomentose above, densely tomentose underneath. Cymes more developed, with 2, 3, or more floral

leaves. Flowers larger, the calyx usually $1\frac{1}{2}$ lines long, tomentose outside and the disk scarcely prominent. Coccii coriaceous.—*Cryptandra Gunnii*, Hook. f. Fl. Tasm. i. 73.

Tasmania. Banks of the Franklin river, near Macquarie Harbour, *Gunn*. Referred by F. Mueller to *S. parvifolium*, from which, however, it appears to me to differ considerably in flowers as well as in foliage.

9. **S. spathulatum**, F. Muell. Herb. Very much-branched, the stellate tomentum close and often assuming a yellowish-golden tint. Leaves cuneate-obovate, 3 to 5 lines long, the margins thickened but scarcely recurved, coriaceous, nearly glabrous above, the under surface hoary or yellowish with a more or less silky and shining pubescence consisting of appressed hairs. Flowers very minute, in little dense heads with a leafy bract at their base, forming short terminal cymes sometimes passing into racemes. Brown bracts minute. Calyx scarcely $\frac{1}{2}$ line long. Disk prominent, undulate, close above the ovary. Capsule near 2 lines long, the persistent bracts much enlarged. Coccii membranous or chartaceous, apparently indehiscent.—*Trymalium spathulatum*, F. Muell. in Trans. Vict. Inst. 1855, 122; *T. daphnooides*, Reissek, in Linnaea, xxix. 278.

S. Australia. South coast, R. Brown; Loftus Ranges, F. Mueller; foot of the Marble range, *Wilhelmi*; Kangaroo Island, Waterhouse.

W. Australia? Herb. Hooker, specimens believed to be from Drummond.

Var. *microphyllum*. Leaves 2 to 3 lines long, usually silvery-white, branches slender, corymbose.—Kangaroo Island, Waterhouse.

10. **S. Lawrencii**, Benth. Low, much-branched, and prostrate or suberect, the tomentum hoary or rusty on the young branches. Leaves nearly orbicular, cordate, ovate or obovate, very obtuse or emarginate, rarely above 2 lines long and often not more than 1 line, thickly coriaceous, the margins much recurved, glabrous or nearly so above, densely tomentose or woolly underneath. Cymes more or less leafy, very dense and hairy, the brown bracts pubescent outside. Calyx scarcely 1 line long, very hairy. Petals nearly sessile. Disk slightly prominent, immediately above the ovary. Coccii crustaceous.—*Cryptandra Lawrencii*, Hook. f. Fl. Tasm. i. 72; *Trymalium microphyllum*, Reissek, in Linnaea, xxix. 273.

Tasmania. E. coast, Great Swan Port, Buckhouse; St. Paul's river, *Gunn*, C. Stuart.

11. **S. cordatum**, Benth. Apparently low and procumbent, much resembling *S. Lawrencii*. Leaves on rather long petioles, broadly cordate, very obtuse or emarginate, 2 to 3 lines long, coriaceous, tomentose above when young, at length glabrous, smooth and shining, the margins much recurved, white or rusty-tomentose underneath. Flower-heads in very compact compound heads, 3 to 4 lines broad, with 2 to 4 floral leaves. Calyx scarcely $\frac{1}{4}$ line long, the tube loosely villous, the lobes nearly glabrous. Disk little prominent, and almost concealed by the hairs of the top of the ovary, although in fact inserted at a small distance above it.—*Cryptandra cordata*, Turez. in Bull. Mosc. 1858, i. 459.

W. Australia. Drummond, 5th Coll., n. 230.

12. **S. phlebophyllum**, F. Muell. Herb. Low, tortuous, and much-branched, with a dense, close, somewhat rusty tomentum. Leaves ovate or

nearly orbicular, very obtuse or emarginate, 3 to 4 lines long or rarely more, the margins thick and recurved, thickly coriaceous, glabrous above with raised reticulations, which distinguish this species from all others as yet known, silky-tomentose underneath with short appressed hairs. Flower-heads very small, in little dense cymes, usually with a small floral leaf. Brown bracts pubescent. Calyx rarely above $\frac{1}{2}$ line long, hairy. Disk annular, undulate, slightly prominent, close above the ovary. Coccii coriaceous.—*Trymalium phlebophyllum*, F. Muell., Reissek, in Linnaea, xxix. 272.

S. Australia. Elders range, near Lake Torrens, F. Mueller.

13. **S. coactilifolium**, Reissek, in Linnaea, xxix. 291. Young branches rusty with a stellate tomentum mixed with spreading hairs. Leaves distinctly petiolate, ovate or obovate, very obtuse or emarginate, mostly 3 to 5 lines long, broad and obtuse at the base, flat on the edges, softly and densely pubescent on both sides, the upper ones often white and almost woolly. Flower-heads combined into very compact compound heads, like those of *S. Lawrencei*, with several white woolly floral leaves. Calyx slender, scarcely 1 line long, very hispid. Disk like that of *S. Lawrencei*, but the annular margin further removed above the ovary.

S. Australia. Encounter Bay, Whitaker, F. Mueller.

Var. *integifolium*. Rather less tomentose, and the leaves not emarginate.—*S. bignoniifolium*, Reissek, in Linnaea, xxix. 289, and *S. Stuartii*, Reissek, l. c. 290. The brown or black stipules and bracts are present in all these, as well as in the original form, but are smaller and less conspicuous in the more scrubby and woolly specimens than in the more luxuriant and elongated ones. F. Mueller unites both these forms with *S. villosifolium*, but both the foliage and the disk appear to me to be quite different.

14. **S. complicatum**, F. Muell. *Fragn.* iii. 78. A rigid, divaricately-branched shrub, allied to *S. coactilifolium* in the indumentum and structure of the flowers, with nearly the foliage of *S. tridentatum*, and of some *Stenanthema*. Leaves nearly sessile, obovate or broadly cuneate, emarginate, with a short recurved point, $\frac{4}{5}$ to $\frac{3}{4}$ in. long, narrowed into a petiole, mostly folded lengthwise, rather thick, softly tomentose on both sides, especially underneath, or nearly glabrous above. Flower-heads compound, nearly globular, sessile, very dense, 3 to 6 lines diameter. Brown bracts very short. Calyx very hirsute, about 1 line long. Disk annular, lining the calyx-tube to a considerable distance above the ovary. Capsule globular or ovoid, $1\frac{1}{2}$ lines long; coccii rather hard, opening in 2 valves.

W. Australia. Dirk Hartog's Island, A. Cunningham; Murchison river and Champion Bay, Oldfield.

15. **S. westringiæfolium**, Benth. Stellate tomentum of the young branches often mixed with short simple pubescence. Leaves narrowly cuneate-oblong, or almost oblong-linear, obtuse, above $\frac{1}{2}$ in. long, much narrowed at the base, the margins recurved, glabrous or nearly so above, densely silky-tomentose with almost appressed hairs underneath. Flower-heads small, in short leafy scarcely branched cymes, often with 1 or 2 floral leaves to each head. Brown bracts ovate-acuminate or lanceolate, often pubescent. Disk of 5 distinct glands close above the ovary.—*Pomaderris westringiæfolia*, Steud. in Pl. Preiss. i. 185; *Trymalium westringiæfolium*, Reissek, in Pl. Preiss. ii. 284.

W. Australia. Limestone plains, Arthur's Head, *Preiss.* n. 1686. The specimen have seen is small and imperfect, but appears very distinct from any other species. The disk is that of *S. spadiceum*, but the foliage and indumentum are very different, and its affinity is more probable with the following species.

16. **S. villosum**, Benth. Tomentum of the young branches hoary or rusty, mixed with stiff spreading hairs. Leaves linear or linear-oblong, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, or shorter on the side branches, mostly with a short recurved point, the margins much recurved, hoary with a minute tomentum or glabrous above, more densely tomentose underneath, and hispid with a few spreading hairs on the midrib and margins. Flower-heads very dense, in shortly pedunculate cymes, with one or two floral leaves. Brown bracts broad. Calyx about $\frac{1}{3}$ line long, tomentose. Disk prominent, divided into distinct glands immediately above the ovary. Petals rather long.—*Cryptandra villosa*, Turcz. in Bull. Mosc. 1858, i. 458.

W. Australia. *Drummond*, 5th Coll. n. 232.

17. **S. pauciflorum**, Benth. Young branches rusty-tomentose. Leaves narrow-oblong, obtuse, mostly about $\frac{1}{2}$ in. long, the margins much recurved, glabrous or minutely tomentose and hoary above, white underneath with a close stellate tomentum mixed with minute simple hairs. Cymes very small, consisting almost of single heads, usually with a floral leaf. Calyx scarcely $\frac{1}{2}$ line long, tomentose. Disk of 5 minute distinct glands close above the ovary. Capsule nearly 1 line long. Coccii membranous, opening inwards in 2 valves.—*Cryptandra pauciflora*, Turcz. in Bull. Mosc. 1858, i. 458.

W. Australia. Swan River, *Drummond*, 5th Coll. n. 233. Evidently allied to the last two species and may possibly prove to be a variety of one of them, but the specimens I have seen appear too distinct to justify their union without further materials.

18. **S. halmaturinum**, F. Muell. Herb. Low and erect, densely tomentose-villous with short spreading hairs, mixed with the closer stellate tomentum. Leaves cuneate-oblong, about $\frac{1}{2}$ in. long, divided at the top into 2 short obtuse spreading lobes, the margins much recurved, green and villous on both sides, or the under one more hoary. Flower-heads very dense, in compact terminal cymes. Brown bracts tomentose outside. Calyx nearly 1 line long, very hirsute. Petal-claws slender. Disk of 5 distinct prominent glands close above the ovary.—*Trymalium halmaturinum*, F. Muell., Reissek, in Linnaea, xxix. 283.

S. Australia. Sandy scrub, Kangaroo Island, *E. G. Sealy*, Waterhouse.

19. **S. bifidum**, F. Muell. Herb. A low heath-like shrub, the tomentum close and stellate. Leaves linear-cuneate, forked at the top, with 2 short obtuse or hooked lobes, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, the margins much revolute, glabrous above, tomentose underneath. Flower-heads in compact terminal compound heads, usually with 2 or 3 prominent and very tomentose floral leaves. Calyx about 1 line long, hirsute with white hairs. Petals clawed. Disk annular, prominent, close above the ovary, at length separating into distinct glands. *Trymalium bifidum*, F. Muell., Reissek, in Linnaea, xxix. 282; *T. stenophyllum*, Reissek, l. c.

S. Australia. Boston Point and Marble Range, *Wilhelmi*.

20. **S. subochreatum**, Reissek, in Linnaea, xxix. 287. A much-

branched heath-like shrub, the tomentum very close, stellate and hoary. Leaves linear or linear-oblong, obtuse, $\frac{1}{2}$ to nearly $\frac{1}{2}$ in. long, the margins much revolute, stellate-tomentose on both sides, or becoming at length glabrous above, occasionally appearing perfectly so from the under side being concealed by the revolute margins. Stipules large and conspicuous, especially at the base of the young shoots, where they are often above 2 lines long. Flower-heads in dense compound terminal heads, of $\frac{1}{2}$ to $\frac{1}{2}$ in. diameter, sessile amongst the last leaves, the floral leaves not very prominent. Flowers considerably larger than in *S. vexilliferum*. Calyx 1 to $1\frac{1}{2}$ lines long, hirsute or tomentose. Petal-claws short. Disk annular, undulate, very prominent, but close above the ovary. Capsule usually ripening a single membranous coccus. F. Muell. Fragm. iii. 82; *Trymalium subochreatum*, F. Muell. in Trans. Vict. Inst. i. 122; *T. Behrii*, Reissek, in Linnaea, xxix. 274; *T. polycephalum*, Turez. in Bull. Mosc. 1858, i. 460.

N. S. Wales. Desert of the Darling and Murray, F. Mueller.

Victoria. Murray scrub, F. Mueller.

S. Australia. S. coast, R. Brown; Boston Point, F. Mueller.

W. Australia. Drummond, 5th Coll. Suppl. n. 91 (l. same number affixed also to *S. vexilliferum hirsutum*), Phillips river and E. Mount Baren, Maxwell. These western specimens are rather coarser and more tomentose, with larger leaves and flowers.

Trymalium leucop. var. F. Muell.; Reissek, in Linnaea, xxix. 274, from the Murray desert, appears to be a slight variety, with smaller, more glabrous leaves, and the hairs of the calyx very white.

21. **S. oligocephalum**, Benth. Very near *S. subochreatum* and may be only a variety, differing from it chiefly in the leaves, like those of *S. vexilliferum*, perfectly glabrous above, or only slightly hoary when very young, and usually much longer and narrower. Stipules remarkably large. Flowers in dense terminal compound heads, sessile amongst the last leaves. Calyx about 1 line long, densely tomento-e-hirsute. Disk annular, undulate, more prominent in some flowers than in others, but always less so than in *S. subochreatum*.—*Trymalium oligocephalum*, Turez. in Bull. Mosc. 1858, i. 460.

W. Australia. Cape Riche, Drummond, 5th Coll. n. 236.

22. **S. vexilliferum**, Reissek, in Linnaea, xxix. 285. A low, straggling, heath-like shrub, with prostrate or suberect branches, not above a foot high, the close stellate tomentum rusty or hoary, the young shoots often somewhat glutinous. Leaves linear linear-oblong or lanceolate, obtuse, mostly $\frac{1}{2}$ in. long, or in some specimens shorter, the margins much revolute, glabrous or nearly so above, except the floral ones, tomentose underneath. Flower-heads compound, very compact, 2 to 3 lines diameter, usually pedunculate, with 1 or 2 petiolate ovate floral leaves, very white and tomentose on both sides, or rarely more like the caudine ones. Brown bracts very numerous. Calyx hirsip, scarcely 1 line long. Disk annular, close to the ovary. Petal-claws very short. Fruiting calyx 2 lines long, with membranous cocci.—*Cryptandra vexillifera*, Hook. Journ. Bot. i. 257; Hook. f. Fl. Tasm. i. 71; *Spiridium phylloides*, Reissek, in Linnaea, xxix. 286; *S. diffusum*, Reissek, l. c. 288.

Victoria. Deserts of the Murray and Murrumbidgee, F. Mueller; in the Grampians, W. Ghail.

Tasmania. Port Dalrymple, R. Brown; northern districts, Gunn.

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S. Australia. S. coast, *R. Brown*; from the mouth of the Murray to St. Vincent's Gulf, *F. Mueller*.

Var. *tatifolium*. More slender and apparently procumbent. Leaves oblong, sometimes rather broadly so, the margins much less incurved. Flower-heads small.—Victoria and S. Australia. Some specimens seem almost to connect this form with *S. obovatum*. F. Mueller proposes to consider *S. sessiliflorum* itself as a variety only of *S. eriocephalum*; but, besides the floral leaves, in all the flowers I have examined I have found the disk much closer upon the ovary. It is possible, however, that this character may not be so constant as it has appeared to be.

23. **S. eriocephalum**, *Fenzl*, in *Heg. Encycl.* 24. An erect, spreading, or prostrate heath-like shrub, with the young branches stellate-tomentose. Leaves linear, rigid, mostly with a short callous or often pungent point, about $\frac{1}{4}$ or rarely near $\frac{1}{2}$ in. long, the margins closely revolute, glabrous above, the under side usually quite concealed. Flower-heads compound, 2 to 3 lines diameter, sessile or shortly pedunculate, usually with 1 or 2 floral leaves like the caudine ones, but broader. Calyx scarcely 1 line long, hispid with white hairs. Disk lining the calyx-tube and forming a ring at some distance above the ovary. Petals clawed. Capsule usually with only one perfect membranous coccus.—*Cryptandra eriocephala*, *Hook. f. Fl. Tasm.* i. 72; *Spyridium prostratum*, *Reissek*, in *Linnaea*, xxix. 284; *S. uncinatum*, *Reissek*, l. c. 289 (with the leaves more frequently pungent).

N. S. Wales. Eurylean scrub, *A. Cunningham*.

Victoria. Desert of the Murray, *F. Mueller*.

Tasmania. Derwent river, *R. Brown*; dry places above Hobart and South Esk, *Gunn*.

S. Australia. Arid places from the mouth of the Murray to Spencer's Gulf, *F. Mueller*.

24. **S. microcephalum**, *Benth.* Apparently procumbent, much-branched, and heath-like, the young branches slender, with a minute rusty tomentum. Leaves linear, obtuse, with a minute callous point, mostly 2 to 3 lines long, the margins closely revolute, glabrous above, the tomentose under side quite concealed. Flower-heads compound, compact, seldom above 3 lines diameter, terminal or lateral, often with 1 or 2 prominent tomentose floral leaves. Calyx less than 1 line long, glabrous. Disk undulate, close above the ovary.—*Cryptandra microcephala*, *Turez.* in *Bull. Mose.* 1858, i. 458.

W. Australia, *Drummond*, 5th Coll. n. 234.

25. **S. ulicinum**, *Benth.* Tall, much-branched, and heath-like, the tomentum hoary or rusty. Leaves crowded, linear or linear-oblong, obtuse, emarginate or shortly bifid, mostly about $\frac{1}{2}$ in. long, the margins revolute, glabrous above or hoary when young, the under side hoary with a very close tomentum. Flowers 1 to 3 together, closely sessile amongst the last leaves of short lateral branches, the central one enclosed in 3 or 4 brown imbricate bracts, the lateral ones with 2 each. Calyx about $2\frac{1}{2}$ lines long, silky-hairy, the lobes nearly as long as the free part of the tube. Petals and stamens at the base of the calyx-lobes, in the sinus of the disk, which lines the calyx-tube and forms a thick undulating ring round the throat, at a considerable distance above the ovary.—*Cryptandra ulicina*, *Hook. Journ. Bot.* i. 257; *Hook. f. Fl. Tasm.* i. 72; *Stenodiscus ulicinus*, *Reissek*, in *Linnaea*, xxix. 296.

Tasmanica. Common on the banks of the Derwent above New Norfolk and Launceston, also on the summit of Mount Wellington, *Gaada*. Although this differs from other *Spriadium*, and approaches *Stenanthemum* and *Cryptandra* in the greater length of the calyx-tube and almost separate flowers, yet the disk is as in *Spriadium*, and it appears better to consider it an extreme form of that genus than a monotypic genus as proposed by Reissek.

10. STENANTHEMUM, Reissek.

Flowers sessile in heads, surrounded by small, persistent, imbricate brown bracts. Calyx-tube adherent at the base, free, slender, and often deciduous above the ovary and disk, 5-lobed at the top. Petals 5, hood-shaped, enclosing the anthers and inserted with the calyx at the top of the calyx-tube. Disk scarcely prominent, round the top of the ovary at the base of the calyx-tube. Ovary wholly inferior, 3-celled. Style entire or minutely 3-toothed. Capsule enclosed in the base of the calyx-tube, which is often contracted over it or deciduous; the endocarp separating into 3 membranous or crustaceous cocci opening in 2 valves. Seeds of *Pomaderris*. Shrubs, with the habit of *Spriadium*. Flowers sessile, in heads, or in one species in a cyme, surrounded by small, persistent, imbricate brown bracts, and sometimes with 1 or 2 floral leaves, as in *Spriadium*.

The genus is confined to Australia. The floral characters are those of *Cryptandra*, with the inflorescence of *Spriadium*.

Leaves obovate, obovate, or broadly oblong.

- Leaves rusty-tomentose underneath 1. *S. pomaderroides*.
- Leaves densely silky underneath. Erect or ascending and much branched 2. *S. leucophractum*.
- Leaves closely white-tomentose underneath. Stems prostrate 3. *S. pimeleoides*.
- Leaves linear-cuneate, emarginate or toothed 4. *S. coronatum*.
- Leaves narrow-linear, the margins closely revolute.
- Flower-heads dense. Calyx tube narrow, very densely hirsute 5. *S. humile*.
- Flower-cymes loose. Calyx tube short, loosely hirsute 6. *S. Waterhousii*.

1. ***S. pomaderroides*, Reissek, in Linnaea, xxix. 295.** Branches wiry, elongated, above 1 ft. long in our specimens. Leaves distant, obovate or oblong, obtuse or with a recurved point, often $\frac{1}{2}$ in. long or even more, narrowed into a petiole, folded lengthwise or concave, hairy or at length nearly glabrous above, rusty or white-tomentose underneath. Flower-heads 3 to 5 lines diameter, surrounded by 2 or 3 floral leaves. Brown bracts numerous, ovate or oblong, nearly as long as the flowers. Calyx $2\frac{1}{2}$ lines long, silky-tomentose outside, tubular but not very slender. Anthers obtuse. *Cryptandra pomaderroides*, Reissek, in Endl. Nov. Stirp. Dec. 29, and Pl. Preiss. ii. 288 (from the description); *Cryptandra tridentata*, β *tomentosa*, Reissek, l. c. 289, and therefore included in *Stenanthemum tridentatum*, Reissek, in Linnaea, xxix. 295.

W. Australia, Drummond, n. 212; Murchison river, Oldfield.

2. ***S. leucophractum*, Reissek, in Linnaea, xxix. 295.** A low, erect or ascending, very much branched shrub, sometimes only a few inches, sometimes several feet high, the young branches rusty-tomentose. Leaves obovate or obovate, with a recurved point, about $\frac{1}{3}$ in. long, folded lengthwise and narrowed into a distinct petiole, the upper surface white with a close soft to-

mentum, the under softly pubescent or densely villous with appressed whitish or rust-coloured hairs. Flower-heads rarely above 3 lines diameter, surrounded by 2 or more floral leaves and several brown bracts. Flowers usually few. Calyx fully 2 lines long, slender and silky-hairy precisely as in *S. pimeleoides*, but it does not appear to be so constricted nor to break off so readily above the ovary.—*Cryptandra leucophracta*, Schlecht. *Linnæa*, xx. 640.

Victoria. Murray desert, *F. Mueller*.

S. Australia. Sandy deserts and arid hills, from the Murray to Spencer's Gulf, *F. Mueller*; Kangaroo Island, *Waterhouse*.

3. **S. pimeleoides**, *Benth.* Low, prostrate, and much-branched, the young branches loosely pubescent-tomentose. Leaves obovate or obocordate, mostly 2 to 3 lines long, flat or folded upwards, often undulate and the edges very slightly recurved, glabrous or the upper ones hoary-tomentose on the upper side, white underneath with a close stellate tomentum, usually mixed with a few longer appressed sometimes silky hairs. Flower-heads very dense, $\frac{1}{2}$ to $\frac{1}{3}$ in. diameter, with numerous imbricate brown bracts and often 2 or 3 tomentose floral leaves. Calyx fully 2 lines long, very slender, hirsute outside with white hairs, after flowering constricted above the ovary and often breaking off when the fruit ripens. Anther-cells rather acute at the lower end.—*Cryptandra (Stenocodon) pimeleoides*, *Hook. f. Fl. Tasm.* i. 73, t. 12.

Tasmania. East coast, at Great Swan Port, *Backhouse, C. Street*; Spring Bay, *Green*. *F. Mueller* (*Fragm.* iii. 77) refers this to *S. leucophracta*, to which it is certainly very nearly allied, but it must be considered at least as a well-marked variety in its prostrate habit and the much closer tomentum, the adult leaves (except the floral ones) nearly glabrous.

4. **S. coronatum**, *Reissek*, in *Linnæa*, xxix. 295. Small and apparently prostrate, the branches pubescent with scattered stellate hairs. Leaves cuneate, emarginate or 3-toothed, 3 to 4 lines long, usually folded lengthwise and softly tomentose on both sides. Flower-heads 3 to 4 lines diameter, sessile amongst 2 to 4 floral leaves, the brown bracts very small and narrow. Calyx nearly 2 lines long, not so slender as in the other species, tomentose outside. Anther-cells obtuse.—*Cryptandra coronata*, *Reissek*, in *Pl. Preiss.* ii. 288.

W. Australia. *Drummond*, 2nd Coll. n. 722.

5. **S. humile**, *Benth.* Stems 2 or 3 in. high, bare below, the flower-heads and leaves closely crowded in the upper part. Leaves narrow-linear, seldom $\frac{1}{2}$ in. long, the margins closely revolute, nearly glabrous above, tomentose and with a few long woolly hairs underneath. Heads few-flowered, almost sessile amongst the leaves. Brown bracts very broad, obtuse or the midrib ending in a fine point. Calyx slender, 2 lines long, densely hispid with long white woolly hairs.

W. Australia. Between Moore and Murchison rivers, *Drummond*, n. 91 (the same number as *Spiridium polycephalum*, but probably from a different set).

6. **S. Waterhousii**, *Benth.* An erect somewhat viscid shrub, the branches slightly tomentose. Stipules linear-lanceolate. Leaves linear, obtuse or with a recurved point, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, the margins closely revolute, glabrous above, slightly tomentose underneath. Flowers not numerous, in rather loose leafy terminal cymes, and not so closely sessile as in the other



species, the floral leaves like those of the stem, or broader, flatter, and more tomentose. Brown bracts 3 under each flower, lanceolate or ovate-lanceolate. Calyx above 1 line long, the tube hirsute with spreading hairs, narrow-turbinate, produced above the disk as in other *Stenanthemum*, but not so slender. Disk undulate-lobed, shortly adnate to the calyx-tube, but at a considerable distance from the lobes and the petals. Fruiting-calyx 2 lines long. Coccii coriaceous, indehiscent.—*Spiridium Waterhousii*, F. Muell. Fragm. iii. 83.

S. Australia. Kangaroo Island, Waterhouse.

11. CRYPTANDRA, Sm.

(*Wichurea*, Nees.)

Calyx-tube adherent at the base, free, campanulate or tubular and persistent above the ovary and disk, 5-lobed at the top or to the middle. Petals 5, hood-shaped, enclosing the anthers and inserted with the stamens at the top of the calyx-tube. Disk annular, or often scarcely prominent round the top of the ovary, at the base of the calyx-tube. Ovary wholly inferior, or slightly prominent in the calyx-tube, 3-celled. Style entire or minutely 3-toothed. Capsule enclosed in the base of the persistent calyx-tube but often partially free within it, the endocarp or the whole capsule separating into 3 crustaceous or rarely membranous cocci usually opening inwards in 2 valves. Seeds of *Pomaderris*.—Shrubs, mostly leath-like or thorny. Leaves small, narrow, often clustered, rarely ovate and flat, often nearly cylindrical, the under surface usually tomentose and whitish, but often concealed by the closely revolute margins. Flowers sessile or shortly pedicellate, mostly surrounded by persistent imbricate brown bracts, either distinct along the smaller branches or clustered in terminal spikes or heads intermixed with leaves, never in cymes.

A genus confined to Australia. Like the majority of *Rhamnæ*, it is chiefly distinguished by habit. The floral characters of the first section are nearly those of *Stenanthemum*, of the second scarcely distinct from *Discaria*, those of *C. glabriiflora* almost as in *Spiridium*.

Secr. 1. *Cryptandra*.—Disk usually pubescent, continuous with the summit of the ovary, either undistinguishable from it or forming a slightly prominent ring round it. Flowers pubescent or hairy, closely sessile in terminal or lateral heads.

Brown bracts acuminate.

Calyx tubular.

Heads many-flowered. Calyx narrow. Ovary almost entirely inferior

1. *C. ericifolia*.

Heads few-flowered. Calyx rather broad. Free part of the ovary longer than the adnate base

2. *C. hispidula*.

Calyx very small, broadly campanulate. Flower-heads densely globular.

3. *C. spyridioides*.

Flower-heads terminal

4. *C. scoparia*.

Flower-heads lateral

Calyx 1 line long or more, the tube longer than the lobes.

Calyx narrow, glabrous outside at the base, tomentose above.

5. *C. spinescens*.

Adnate base of the ovary longer than the free top

Calyx broadly campanulate or urceolate, tomentose all over.

Free part of the ovary longer than the adnate base

6. *C. amara*.

Calyx unrotate globular, densely covered with white wool	7. <i>C. lanuginosa</i> .
Calyx-lobes as long as the tube or longer.	
Calyx campanulate, usually 1 line long or more, and glabrous outside at the base	8. <i>C. tomentosa</i> .
Calyx very open, under 1 line, tomentose all over	9. <i>C. nutans</i> .
Calyx glabrous, divided almost to the base	10. <i>C. glabriiflora</i> .
Flowers often large, pubescent or hairy (except <i>C. glabriiflora</i>), sessile.	
Brown bracts broad, imbricate, covering the whole or a great portion of the calyx-tube.	
Leaves broadly ovate, flat, mostly $\frac{1}{2}$ in. long	15. <i>C. buxifolia</i> .
Leaves narrow and heath-like or minute, the margins revolute.	
Stems slender, prostrate. Calyx-lobes shorter than the tube	11. <i>C. alpina</i> .
Stems rigid, divaricate. Calyx small, glabrous, divided almost to the base	10. <i>C. glabriiflora</i> .
Stems rigid, divaricate. Calyx silky-hairy, usually above 2 lines, the lobes narrow, about equaling the tube.	
Leaves slender, about 1 line long	12. <i>C. leucopogon</i> .
Leaves slender, mostly 2 to 3 lines long	13. <i>C. propinquia</i> .
Leaves minute, obovoid, mostly $\frac{1}{2}$ line long	14. <i>C. parvifolia</i> .
Flowers very small, pedicellate within the minute bracts.	
Flowers pubescent	16. <i>C. pungens</i> .
Flowers glabrous	17. <i>C. multa</i> .
SPEC. 2. <i>Wichurea</i> .—Disk glabrous or villous, distinct from the ovary, usually ovoid. Calyx glabrous or very slightly tomentose.	
Leaves linear, with revolute margins.	
Calyx campanulate, deeply lobed. Disk and ovary glabrous	18. <i>C. longistaminata</i> .
Calyx ovoid, not 1 line long. Disk glabrous. Summit of the ovary villous	20. <i>C. miliaris</i> .
Calyx tubular, about 2 lines long. Disk villous. Summit of the ovary glabrous	19. <i>C. arbutiflora</i> .
Leaves spatulate or linear-cuneate. Calyx tubular, about 2 lines long. Disk and ovary glabrous	21. <i>C. nudiflora</i> .
<i>C. nudiflora</i> , a name attributed to Smith by Roxburgh and Schultze, Synt. iv, 372, is illegitimate, made up of a part of Smith's <i>ericifolia</i> and a part of the name of the habitat, <i>Cryptandra</i> , A. Cunn., quoted by Don under <i>Sideroxylon</i> (<i>Hort. Calcutt.</i>), also illegitimate; <i>Cryptandra</i> , in the place referred to, Field, N. S. Wales, 352, gives no name to the plant.)	

SECTION I. *CRYPTANDRA*.—Disk usually pubescent, continuous with the summit of the ovary, either descending straight from it or forming a slightly prominent ring round it. Some of the first species pass almost into *Solanum themum*.

1. ***C. ericifolia***, Sm. in *Trans. Linn. Soc.* x, 294, t. 18, f. 1. Branches elongated and twiggish, with few smaller branchlets, always unarmed, more or less pubescent with simple appressed hairs. Leaves linear-terete or with a slightly prominent midrib, 2 to 4 lines long, often clustered or crowded, glabrous or pubescent with simple appressed hairs. Flowers crowded in little terminal heads, surrounded by leafy bracts, and a flower by several imbricate, acuminate, and ciliate brown bracts, often half as long as the calyx. Calyx narrow-campanulate, about 2 lines long, silky-hairy outside, the lobes short and spreading. Ovary very small, slightly projecting above the very short adnate part. Syllepsis absent at the base. Disk inconspicuous. Coccini opening in 2 valves.—*C. capitata*, Sieb. Pl. Exs.

N. S. Wales.—Moist heaths near Sydney, R. Brown, A. Cunningham, Sieber, n. 66, and others, but apparently not very common.

2. **C. hispidula**, Reissek, in *Linnaea*, xxix, 294. Very near *C. ericifolia*, but the leaves are smaller and more frequently pubescent, the flowers fewer, more silky, the calyx rather broader, $1\frac{1}{2}$ to 2 lines long when fully out, and the free part of the ovary within the calyx is much longer than the adnate portion.

S. Australia. Encounter Bay and St. Vincent's Gulf, *F. Mueller*, *Whittaker*.

3. **C. spyridioides**, *F. Muell.* *Fragm.* iii. 68. A low, much-branched, divariccate shrub, rarely spiny, the young branches minutely hoary. Leaves oblong-linear, obtuse, 2 to 3 lines long, the margins revolute, green and usually glabrous above, often hoary or whitish underneath with a minute tomentum. Flowers very small, in dense terminal globular heads. Brown bracts fringed or ciliate, not half so long as the calyx. Calyx silky-pubescent, about 1 line long, the adnate base narrow, the tube campanulate above the ovary, the lobes rather shorter than the tube. Summit of the ovary much depressed, thickened round the edge into an obscure disk.

W. Australia. Murchison river, *Oldfield*. Very closely allied to *C. scoparia*.

4. **C. scoparia**, Reissek, in *Pl. Preiss.* i. 283. A rigid shrub, the branches in the original specimens virgate, heath-like, and seldom spinous, in others divaricately branched and frequently spiny, very slightly hoary when young. Leaves linear, obtuse, 2 to 3 lines long, or in luxuriant specimens rather acute and attaining 3 or 4 lines, the margins revolute so as to be almost terete, usually glabrous. Flowers in dense globular clusters, almost sessile along the principal branches, and surrounded by a few short floral leaves, or borne on very short leafy branches, often above 3 lines diameter when fully out. Each flower sessile within 3 or 4 broad, brown, scarious, ciliate or fringed, shortly pointed bracts, about half as long as the calyx. Calyx when first open about $\frac{1}{2}$ line long and silky-pubescent, when fully out about 1 line long and nearly glabrous, or with a tuft of long hairs on each lobe, broadly campanulate, the lobes longer than the tube. Summit of the ovary much depressed, thickened round the edge into an obscure disk.

W. Australia. Swan River, *Decandolle*: sandy woods near Perth, *Preiss.* n. 1215. *Var. microphylla*. More branched with numerous slender spikes. Flowers in heads small. Murchison river, *Oldfield*.

5. **C. spinescens**, Sieb. in *DC. Prod.* ii. 38. Nearly allied to *C. anara*, and with nearly the same foliage, but the branches are usually more twiggy and the spinous branchlets more densely crowded. Leaves usually linear or linear-oblong, 2 or rarely 3 lines long, but occasionally small and obovate. Flowers smaller than in *C. anara*, and more distinctly although very shortly pedicellate. Calyx $1\frac{1}{2}$ to 2 lines long, narrow-campanulate, the adnate base glabrous and suddenly contracted into a little tipes about the length of the imbricate brown bracts, the free part white-tomentose outside. Ovary almost entirely inferior, the pubescent summit slightly prominent above the adnate part and obscurely grooved opposite the stamens, but without any distinct disk. Capsule oblong, $1\frac{1}{2}$ to 2 lines long, almost included in the glabrous, elongated, adnate base of the calyx-tube, shortly free in the upper part. Coccæ thinly crustaceous.—*C. pyramidalis*, R. Br., *Brongni.* in *Ann. Sc. Nat.* x. 373.

N. S. Wales. About Port Jackson and on the Nepean river, *R. Brown*, *Sieber*, n. 63, and *Fl. Mact.* n. 691; N. of Bathurst, *A. Cunningham*; Cabramatta, *W. Hills*. This is considered by F. Mueller (*Fragn.* iii. 67) as an abnormal state of *C. amara*, but I find the characters constant in numerous specimens from various collectors, both in flower and fruit.

6. **C. amara**, *Sm.* in *Trans. Linn. Soc.* x. 295, *t.* 18, *f.* 2. A rigid, wiry, decumbent or subereet, much-branched shrub, the young branches minutely hoary with a close stellate down, the smaller ones often ending in a fine thorn. Leaves solitary or clustered, linear or linear-oblong, usually 1 to 2 and rarely 3 lines long, obtuse or acute, rigid, glabrous or nearly so, the margins usually recurved. Flowers almost sessile, solitary within the bracts, but usually several together, forming short leafy spikes or racemes on the smaller branches. Calyx at the time of flowering, 1 to 1½ lines long, campanulate, white outside with a close minute down, very shortly adnate by its obtuse base, the lobes usually shorter than the tube, the brown imbricate bracts not exceeding the adnate base and very obtuse. Ovary densely pubescent, included in the tube, but adnate only below the middle, the disk not distinct. Fruiting calyx often 3 lines long, enclosing the capsule, which remains adherent at the base only or below the middle. Coccini crustaceous.—DC. *Prod.* ii. 38; F. Muell. *Fragn.* iii. 66; *C. Sieberi*, Fenzl, in *Hueg. Enam.* 23; *Hook. f. Fl. Tasm.* i. 74; *C. campanulata*, Schlecht. *Linnava*, xx. 639; F. Muell. *Fragn.* iii. 67, partly; *C. nervata*, Reissek, in *Linnava*, xxix. 291; *C. largiflora*, F. Muell., Reissek, in *Linnava*, xxix. 292.

Queensland. Kent's Lagoons, *Leichhardt*; Mount Mitchell, *Beckler*.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, n. 67, and *Fl. Mact.* n. 492, northward to Clarence River, *Beckler*, and New England, *C. Stuart*; in the interior to the Lachlan river, *Fraser*; St. George's Range, *A. Cunningham*; Darling and Murray desert, *Herb. F. Mueller*.

Victoria. Arid hills and stony tracts, ascending into the Alps, *F. Mueller*.

Tasmania. North Esk river, *Lawrence*, *Gunn*, and others.

S. Australia. Between the Murray and St. Vincent's Gulf, *Bohr*, *F. Mueller*.

Independently of the diversity in the size of the flowers resulting from age, there appear to be two distinct varieties with large and small flowers, the calyx in the latter usually broader and more deeply lobed, both of them included among Sieber's specimens; the southern ones belong chiefly to smaller-flowered varieties. These have usually the free part of the ovary less prominent, but in Cunningham and Fraser's specimens from the interior the ovary and capsule are very prominent, whilst the calyx is small and much more loosely pubescent than usual. Some specimens are remarkable for their short, almost ovate leaves.

7. **C. lanosiflora**, *F. Muell.* *Fragn.* iii. 65. A divaricately-branched shrub, of 1 to 2 ft., the young branches minutely hoary, not spinescent in our specimens. Leaves linear or linear-oblong, 1 to 3 lines long, the margins revolute, glabrous. Flowers almost sessile, few together at the ends of the branches, forming short, leafy, oblong or almost globular spikes. Calyx globular, 1½ to nearly 2 lines diameter, densely covered with a very white crisped wool, the lobes much shorter than the tube, the brown imbricate bracts very broad and obtuse, about half as long as the tube. Ovary very short, almost wholly inferior, the summit expanded into a pubescent slightly undulate disk. Capsule more than half superior.

N. S. Wales. Mountains of New England on the Severn, *C. Stuart*; Mount Mitchell, towards the Clarence river, *Beckler*.

8. **C. tomentosa**, Lindl. in *Mitch. Thrice Exped.* ii. 178. Very much branched, but seldom thorny, the young branches tomentose. Leaves linear or oblong, obtuse or acute, 1 to 2 lines long or rarely more, the margins recurved and frequently hoary underneath. Flowers usually 5 to 8 together, clustered at the ends of the branches, in short spikes or almost heads. Calyx varying in size from about 1 to 1½ lines, rather urceolate than campanulate, the lobes usually at least as long as the tube, very spreading when fully out, but often connivent again after flowering, slightly tomentose outside, except at the base. Ovary and capsule nearly as in *C. amara*, from which this species may be generally distinguished by its smaller leaves, by the whole plant often minutely hoary pubescent, by the flowers more crowded in shorter heads, and by the deeper-lobed calyx, glabrous outside at the base, and only slightly silky-tomentose on the lobes.—*C. propinqua*, Schlecht. *Linnaea*, xx. 638, not A. Cunn.; *C. erubescens*, F. Muell., Reissek, in *Linnaea*, xxix. 293; *C. Behriana*, Reissek, l. c.; *C. campanulata*, F. Muell. *Fragm.* iii. 67, partly.

N. S. Wales. In the interior, *Fraser*.

Victoria. In the Grampians, *Mitchell*, F. Mueller; on the Murray and generally in the N.W. interior, *Herb. F. Mueller*.

S. Australia. From the Murray to Spencer's Gulf, F. Mueller.

S. divaricata, Reissek, in *Pl. Preiss.* ii. 286, from Mitchell's early expeditions, must probably also be referred to *C. tomentosa*. I have seen no authentically-named specimen, but the only one of Mitchell's collections answering to the character given scarcely differs from the common forms of *C. tomentosa*.

9. **C. nutans**, Steud. in *Pl. Preiss.* i. 186. In habit and foliage this species much resembles *C. tomentosa*, but the flowers are different. Leaves rarely above 2 lines long, pubescent or glabrous. Flowers small, crowded in short terminal spikes, or sometimes few and not so close. Brown bracts not one-third the length of the calyx, and often shortly acuminate. Calyx very broadly campanulate, about 1 line long or rather less, hoary or almost silky outside, the lobes deep and very spreading. Free part of the ovary broader and flatter than in *C. tomentosa*. Disk inconspicuous.—*C. tomentosa*, Reissek, in *Pl. Preiss.* ii. 286, not of Lindl.

W. Australia. Swan River, *Drummond*, 1st Coll. and 2nd Coll. n. 216, *Roe*, etc.; sandy woods near the sea, *Preiss.* n. 2424; Champion Bay, *Oldfield*.

Var. (?) *micrantha*. Flowers about ½ line long, or even less.—Swan River, *Drummond*, *Roe*, *Harvey*; William river, *Oldfield*.

10. **C. glabriiflora**, Benth. Branches numerous, rather rigid, divariccate, often spinescent, glabrous or nearly so. Leaves linear or oblong, obtuse, 1 or rarely 2 lines long, the margins revolute, glabrous. Flowers sessile and clustered along the branches, usually quite glabrous. Brown bracts broad, imbricate, covering the very short tube. Calyx very broadly campanulate, 1 to 1½ lines long, the lobes very spreading, reaching almost to the ovary. Ovary more than half inferior, thickened into a broad disk at the top.

W. Australia. Murchison river, *Oldfield*. The habit of this species is entirely that of *Cryptandra*, whilst the extreme shortness of the calyx-tube above the ovary or disk brings it almost into *Spiridium*.

11. **C. alpina**, Hook. f. *Fl. Tasm.* i. 75, t. 12. A small prostrate species, with numerous slender wiry branches, rarely extending above 6 in., with little heath-like glabrous leaves, seldom more than 1 line long. Flowers

mostly solitary at the ends of the branches. Brown bracts broad, imbricate, obtuse or acute, the inner ones often nearly as long as the calyx-tube. Calyx broadly campanulate, tomentose outside, rather more than 2 lines long, with ovate-lanceolate lobes, rather shorter than the tube. Disk undulate, villous, scarcely distinct from the summit of the ovary.

Tasmania. On the summits of the Western Mountains, about 3500 ft. elevation, *Griseb.*, *Archer*.

12. **C. leucopogon**, *Meisn.*, *Reisek*, in *Pl. Preiss.* ii. 287. Very nearly allied to *C. propinqua*, and may prove to be a variety only, the flowers and bracts being similar in shape and relative proportions, but the slender branches and small leaves are more like those of *C. alpina*, except that the stems are apparently erect, not prostrate. The flowers are also rather smaller than in *C. propinqua*, and the calyx-lobes have longer silky hairs.

W. Australia. Sandy plains of the Gordon river, *Preiss*, n. 752. (*Herb. Sond*.)

13. **C. propinqua**, *J. Conn.*, *Fenzl*, in *Hueg. Encyc.* 23. A rigid, divaricate, heath-like shrub, nearly glabrous. Leaves crowded or clustered on the smaller branches, linear-terete, mostly 2 to 3 lines long, and usually acute. Flowers 3 to 8 together at the ends of the branches, and larger than in most species. Calyx varying from 2½ to 3½ lines long, very silky-hairy outside, the tube enclosed within the broad, brown, ciliate, imbricate bracts, the lobes narrow-lanceolate, fully as long as the tube. Disk round the ovary continuous with it, but prominent and often nearly glabrous.

N. S. Wales. In the interior, *A. Cunningham*, *Mitchell*; between Bathurst Plains and Wellington Valley, *Fraser*; N.W. branch of Hunter's River, *A. Cunningham*; Paramatta, *Woolss*; New England, near Tenterfield, *C. Stuart*.

Var. *grandiflora*. Flowers exceeding 3 lines in length.—*C. magniflora*, *F. Muell. Fragm.* iii. 65.—Sandy desert between the Darling and Murray, *Herb. F. Mueller*. This variety is also amongst Cunningham's plants, who had given it the name of *C. speciosa*, and designated the smaller variety by that of *propinqua*, as being near the larger one. Unfortunately this latter name was the only one in the Vienna herbarium, and was thus, although inappropriate, adopted by Fenzl for the species, and has given rise to the opinion that some variety of the common *C. amara* was intended by it.

14. **C. parvifolia**, *Tarez.* in *Bull. Mose.* 1858, i. 459. Branches very rigid, divaricate, the young ones hoary with a minute stellate down, and appearing at first sight deprived of all leaves except distant clusters of minute stipules, amongst which however will generally be found 2 or 3 minute obtuse to linear leaves, thick, very obtuse or with a minute recurved point, seldom 1 line long, the margins revolute. Flowers solitary or 2 to 6 together, closely sessile at the summits of the branches. Calyx about 3 lines long, the tube closely covered with large, brown, obtuse, imbricate bracts, the lanceolate lobes silky outside and spreading. Summit of the ovary broad and depressed, thickened round the margin into a pubescent disk.

W. Australia, *Drummond*, 4th Coll. n. 156.

15. **C. buxifolia**, *Fenzl*, in *Hueg. Encyc.* 23. Stems erect from a woody rhizome, but little branched, hoary with a minute stellate tomentum. Leaves ovate, obtuse or pointed, mostly about $\frac{1}{2}$ in. long, glabrous above, white underneath, giving the plant a very different aspect from the rest of the genus. Flowers sessile, in terminal leafy heads. Calyx tubular-campanulate,

nearly 3 lines long, hoary-tomentose outside, the tube nearly covered by the brown imbricate bracts, the lobes short, narrow, and spreading. Ovary scarcely prominent at the bottom of the tube, flat at the top, but without any distinct disk.

W. S. Wales. Rocky hills on the meridian of B. Thurst, on the parallel of 30° 50'; Mount Yongo on the route to Hunter's River, and Goulburn river, *A. Cunningham*.

16. **C. pungens**, Steud. in *Pl. Preiss.* i. 187. Resembling in habit *C. spinoscaulis*, the numerous short branches terminating in slender spines. Leaves mostly fasciculate, 2 to 3 lines long, obtuse or with a slightly recurved point. Flowers small and numerous, on pedicels of $\frac{1}{2}$ to nearly 1 line long, with minute, imbricate, acuminate, brown bracts at their base, and not under the calyx. Calyx about $\frac{1}{3}$ line long, broadly campanulate, the lobes fully as long as the tube, softly pubescent outside. Free part of the ovary very broad and flat, and slightly thickened on the edge into a villous disk. Fruiting calyx more turbinate, above 1 line long, the pubescent capsule nearly as long as the calyx-lobes.—*C. holostyla*, Steud. in *Pl. Preiss.* i. 188.

W. Australia. Swan River, *Drummond*; sandy woods and limestone hills near the sea, *Preiss.* n. 2422 and 2423; south-west coast, *Baxter*.

17. **C. mutila**, Nees, *Reissek*, in *Pl. Preiss.* ii. 289. A low heath-like shrub, with slender virgate almost spineless branches, hoary with minute stiff hairs. Leaves linear, mostly $1\frac{1}{2}$ to 2 or scarcely 3 lines long, the margins much revolute, glabrous or nearly so. Flowers in little sessile clusters in the upper axils, forming short, dense, terminal or nearly terminal leafy racemes, each flower on a pedicel of 1 to $1\frac{1}{2}$ lines, within 3 or more minute brown bracts at the base of the pedicel. Calyx about $\frac{1}{3}$ line long, glabrous outside, the lobes very spreading. Free part of the ovary broad and flat, the edge thickened into a minute almost 5-lobed disk. Fruit not seen.

W. Australia. Swan River, *Drummond*, 2nd Coll., n. 723; Freemantle, *Collie*, *Oldfield*; limestone hills near the sea, *Preiss.* n. 1217 and 1229.

SECTION 2. WICHUREA, Nees (as a genus).—Disk glabrous or villous, distinct from the ovary, usually annular and rather broad. Flowers usually glabrous, except in *C. longistaminea*, where they are slightly tomentose. The characters of this section are very nearly those of *Discaria*, especially in the flower. It is however at once known by the habit, alternate leaves, and small fruits.

18. **C. longistaminea**, F. Muell. *Pragm.* iii. 64. A much-branched unarmed shrub of 2 or 3 ft., the smaller branches minutely hoary-tomentose. Leaves ovate or oblong, obtuse, 1 to 2 lines long, the margins recurved or revolute, glabrous above, minutely silky-tomentose underneath or almost glabrous. Flowers numerous, crowded on the smaller branches, but not quite sessile. Brown bracts imbricate round the base of the calyx-tube. Calyx about 2 lines long, minutely silky outside, divided below the middle into spreading lobes. Petals on slender claws, at first enclosing the stamens, but reflexed after the calyx opens, leaving the stamens erect and apparently exserted. Disk annular, glabrous or very minutely tomentose, quite distinct from the ovary. Ovary sessile or slightly immersed in the disk. Style very shortly 3-lobed. Fruit not seen.

N. S. Wales. New England, *C. Stuart*.

19. **C. arbutiflora**, *Fenzl*, in *Hueg. Enum.* 26. Branches virgate, slightly pubescent, with numerous short branchlets occasionally spinous. Leaves narrow-linear, obtuse or with a minute recurved point, 1 to 3 lines long, with the margins much revolute so as to be almost terete. Flowers white, fragrant, sessile, or very shortly pedicellate on the smaller branches, not crowded, quite glabrous, the broad obtuse imbricate brown bracts forming a minute cup at their base. Calyx about 2 lines long, broadly tubular, with very short lobes. Disk undulate, villous, covering the small glabrous top of the ovary, which is almost entirely free from the calyx, but enclosed in the tube. Capsule filling the calyx-tube, glabrous, the disk remaining round its base. Coccii indehiscent or 2-valved. —*Wichurea arbutiflora*, Nees, in *Pl. Preiss.* ii. 290; *C. suavis*, Lindl. *Bot. Reg.* 1844, t. 56.

W. Australia. Swan River, *Drummond*, 1st Coll.; sandy woods near Guildford, *Preiss.* n. 465 and 472; King George's Sound, *Huegel*.

Var. *tubulosa*. More slender and spinous, resembling *C. spinosescens* in aspect; branches almost or quite glabrous; calyx-tube very slender. *C. tubulosa*, *Fenzl*, in *Hueg. Enum.* 26; *Wichurea tubulosa*, Nees, in *Pl. Preiss.* ii. 291.—Swan River, *Heegd*, *Drummond*; sandy rocks on the N. side of Mount Clarence, *Preiss.* n. 473; Vasse river and Murchison river, *Oldfield*.

20. **C. miliaris**, *Reissek*, in *Pl. Preiss.* ii. 258. Branches long and virgate, with numerous short spinous branchlets, as in *C. spinosescens*. Leaves nearly as in that species, narrow-linear, 2 to 3 lines long, the margins recurved or revolute, glabrous or pubescent. Flowers very small, not quite sessile, forming little loose leafy racemes or clusters on the side-branches. Calyx campanulate, less than 1 line long in our specimens, but not fully out, the very obtuse, imbricate, brown bracts nearly half as long as the calyx; lobes of the calyx as long as the tube. Disk glabrous, undulate, close round the pubescent ovary. Fruit not seen.—*C. lusiophylla* and *C. glabrata*, *Steud.* in *Pl. Preiss.* i. 188.

W. Australia. Sandy woods near Perth, *Preiss.* n. 2420.

C. teucrioides, *Steud.* in *Pl. Preiss.* i. 189, from W. Australia, *Preiss.* n. 2419, very imperfectly described from a specimen not yet in flower, which I have not seen, may be this species, but it is utterly unrecognizable.

21. **C. nudiflora**, *F. Muell. Fragn.* iii. 64. Branches decumbent or divariccate, the short branchlets often rigid but scarcely spinescent in our specimens. Leaves linear-cuneate or spatulate, obtuse or truncate, 2 to 6 lines long, flat or conduplicate. Flowers pedicellate, clustered with small leaves along the branches, but not crowded, the acuminate brown bracts very small at the base of the pedicels. Calyx quite glabrous, about 2 lines long, broadly tubular, the lobes short. Disk annular, rather thick, undulate, glabrous as well as the ovary, but quite distinct from it. Ovary quite free, sessile on the centre of the disk. Fruit not seen.

W. Australia. Port Gregory and Murchison river, *Oldfield*. In floral characters this species is almost a *Discaria*, but the habit is quite that of *Cryptandra*.

12. **DISCARIA**, Hook.(Tetrapasma, *G. Don.*)

Calyx campanulate or tubular above the ovary, shortly 4- or 5-lobed. Petals hood-shaped, inserted with the stamens at the base of the calyx-lobes or none. Stamens 4 or 5, with short filaments, included in the petals when present. Disk annular in the base of the calyx-tube, the margin shortly free. Ovary more or less immersed in the disk, 3-lobed, 3-celled; style slender, with a shortly 3-lobed stigma. Drape or capsule coriaceous, 3-lobed, the endocarp separating into 3 2-valved crustaceous cocci. Seeds with a coriaceous testa; albumen fleshy; cotyledons orbicular.—Much-branched rigid shrubs, with opposite, often thorny branchlets. Leaves small, opposite, 1-nerved or pinnerved. Stipules and bracts small. Flowers axillary.

The genus is chiefly S. American, extratropical or alpine, with one species endemic in Australia and another in New Zealand.

1. **D. australis**, *Hook. Bot. Misc.* i. 157, t. 45. A scrubby, much-branched, thorny shrub of 1 to 2 ft., usually glabrous. Branches green, terete, the smaller ones reduced to stout spines of 1 to 1½ in. Leaves often appearing clustered from the shortness of the shoots, oblong or cuneate, obtuse or emarginate, rarely exceeding ½ in. Pedicels solitary or clustered in the axils of small leaves, which soon fall off from the very short branches, the flowers then appearing densely clustered under the spines. Calyx-tube broadly campanulate above the disk, the limb spreading to about 2 lines diameter. Petals narrow, hood-shaped. Ovary deeply immersed in the disk, the short free part 3-lobed. Fruit 2 to 3 lines diameter. — *Hook. f. Fl. Tasm.* i. 69; *Reissek*, in *Linnaea*, xxix. 266; *F. Muell. Fragm.* iii. 83; *Colletia pubescens*, *Brongn.* in *Ann. Sc. Nat.* x. 366; *Tetrapasma juncea*, *G. Don*, *Gen. Syst.* ii. 40; *Colletia Cunninghamii*, *Fenzl*, in *Hueg. Enum.* 23.

N. S. Wales. Cox's, Macquarie's, and Hunter's rivers, *A. Cunningham*; Liverpool plains, *Woolss*; Ben Lomond, New England, *Beckler*.

Victoria. Grassy hills and banks, ascending the Lower Alps, Delatite river, between Loddon and Creswick rivers, Snowy River, etc., *F. Mueller*.

Tasmania. Derwent river, *R. Brown*; Launceston road and South Esk river, *Gunn*; Great Swan Port, *Backhouse*; Brown river, *Oldfield*.

ORDER XXXVII. AMPÉLIDÆ.

Flowers regular, hermaphrodite or unisexual. Calyx small, entire or 4- or 5-toothed. Petals 4 or 5, free or cohering, valvate in the bud. Stamens 4 or 5, opposite the petals, inserted on the outside of the disk at its base or between its lobes. Disk free or adnate to the ovary. Ovary usually immersed in or surrounded by the disk, more or less perfectly 2- to 6-celled; style short and conical or subulate, or none; stigma small, capitate or lobed. Ovules 2 in each cell where there are 2 cells, solitary where there are more cells, erect, anatropous, with a ventral raphe. Fruit a berry, the dissepiments frequently disappearing. Seeds 1 to 6; testa hard, the inner coating frequently penetrating into the fissures of the ruminate albumen. Embryo short, in the base of the albumen; cotyledons oval; radicle short, inferior.—

Woody climbers or rarely erect shrubs or small trees. Branches often articulated. Leaves alternate or the lower ones opposite, simple or compound, the petiole usually articulate with the stem and expanded into a membranous stipule. Flowers small, in little umbels, cymes, racemes, or spikes, arranged in leaf-opposed, cymose, thyrsoid, or elongated panicles.

The Order, almost or quite limited to the two following genera, is widely dispersed over the tropical and warm regions of the globe, more abundant in the Old World than in America, and the smaller genus confined to the Old World. It is very nearly allied to *Celastrinææ*, and especially to *Rhamnææ*, from which it differs in habit, in the more developed petals, in the baccate fruit and in the smallness of the embryo.

Stamens free. Ovary 2-celled with 2 ovules in each cell. Woody climbers, with	1. <i>VITIS</i> .
tendrils	
Stamens and petals connate with the disk. Ovary 3- to 6-celled with 1 ovule in	2. <i>LEPFA</i> .
each cell. Erect, without tendrils	

I. *VITIS*, Linn.

(*Cissus*, Linn.)

Petals free or cohering at the tips, and falling off together. Stamens inserted round the base of the short, annular, or lobed disk. Ovary 2-celled (sometimes imperfectly so), with 2 ovules in each cell.—Woody climbers or rarely bushy shrubs, with leaf-opposed tendrils (abortive inflorescences). Leaves simple or compound, sometimes marked with pellucid dots. Panicles in the Australian species cymose or rarely reduced to solitary umbels. Petals very concave, almost hood-shaped, but without the dorsal appendages of some Asiatic species.

The genus comprises nearly the whole of the Order, extending over the whole of its geographical area. Of the 14 Australian species, 3 are widely distributed over tropical Asia, another extends to the Fiji Islands, the remaining 10 are endemic. The Australian species appear tolerably constant in the division of their leaves, but that character is not to be absolutely relied on, for the trifoliolate, digitate, and pedate forms will occasionally pass one into the other.

Leaves simple.

Leaves ovate, penniveined, or 3-nerved at the base, rather fleshy.

Leaves shortly acuminate, mostly toothed. Berries globular. Tall, woody climbers 1. *V. antarctica*.

Leaves very obtuse, quite entire. Berries obovoid. Bushy tree 2. *V. oblonga*.

Leaves broad-cordate, 5-nerved, membranous.

Branches glaucous. Veinlets reticulate, not prominent. Flowers at least 1 line diameter 3. *V. cordata*.

Not glaucous. Veinlets transverse. Flowers not $\frac{1}{2}$ line diameter 4. *V. adnata*.

Leaflets 3.

Leaflets ovate, rather thick and firm, shining. Cymes nearly globular, on very short peduncles. Stigma very broad 5. *V. nilens*.

Leaflets large, broadly ovate or cordate, membranous. Cymes loose, divariccate.

Leaves glabrous, or nearly so. Flowers fully 1 line diameter, on stout pedicels 6. *V. saponaria*.

Leaves hairy on both sides. Flowers about $\frac{1}{2}$ line diameter, on siliiform pedicels 7. *V. verris*.

Leaflets mostly under 2 in., rather thick, or almost fleshy, coarsely toothed. Cymes loose, divariccate 8. *V. trifolia*.



Leaflets 5 to 9, pedate.	
Leaflets small, ovate, acuminate, deeply toothed. Disk very prominent.	9. <i>V. clematidea</i> .
Leaflets 2 to 3 in. long, oblong or cuneate, minutely and remotely serrate or entire. Disk inconspicuous	10. <i>V. acetosa</i> .
Leaflets 5, rarely 3, digitate.	
Leaflets obtuse at the base, on a distinct slender petiolule, coriaceous, and very reticulate	11. <i>V. hypoglauca</i> .
Leaflets narrowed into a very short petiolule or sessile.	
Leaflets very coriaceous. Berries ovoid	12. <i>V. sterculiifolia</i> .
Leaflets membranous. Berries globular.	
Leaflets linear-cuneate to oblong or obovate. Cymes loose	13. <i>V. opaca</i> .
Leaflets narrow-linear, rarely broad and acuminate. Cymes compact	14. <i>V. coryliifolia</i> .

1. ***V. antarctica*, Benth.** Young shoots more or less clothed with short rust-coloured hairs, rarely entirely glabrous. Leaves simple, petiolate, ovate or oblong, mostly acuminate and slightly cordate, 3 to 4 in. long and $1\frac{1}{2}$ to 2 in. broad, entire, sinuate or irregularly toothed, rather firm or almost coriaceous, pinniveined and obscurely 3-nerved, with glands on the under side in the axils of some of the principal veins. Cymes dense, broadly corymbose, shorter than the petioles. Flowers tenaceous-pubescent, the buds nearly globular, under 1 line diameter. Petals 4, separately deciduous. Disk prominent, undulate, obscurely 4-lobed. Style shortly conical. Berry globular.—*Cissus antarctica*, Vent. Choix, t. 21; DC. Prod. ii. 629; Bot. Mag. t. 2488; *C. glandulosa*, Poir. Dict. Suppl. i. 105.

Queensland. Brisbane river, Moreton Bay, *V. Mueller*.

N. S. Wales. Port Jackson, R. Brown, and others; northward to Hastings and Macleay rivers, Beckler; New England, C. Stuart; southward to Illawarra, A. Cunningham, Herb. Muller. The specific name, although inappropriate, is too generally sanctioned by use to be altered.

2. ***V. oblonga*, Benth.** A small bushy tree (according to Hemie's notes, but R. Brown's specimens have tendrils), quite glabrous or the young shoots minutely rusty-tomentose, the branches rigid and flexuous. Leaves petiolate, broadly oblong; or ovate-oblong, very obtuse, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, quite entire, firm but thinner than in *C. antarctica*, very finely pinniveined and obscurely 3-nerved, with 2 large glands underneath in the axils of the lateral nerves. Flowers not seen. Fruiting cymes on short peduncles, bearing few obovoid berries.

Queensland. E. coast, R. Brown; Curtis Island, Herce. On some cymes the berries are replaced by a monstrous growth of dichotomous branches covered with small, broad, leathery scales, forming dense globular tufts of 3 or 4 in. diameter, like those often observed on some *Masos*. Although I have seen no flowers, the inflorescence, fruits, and seeds, as well as the tendency to articulation of the smaller branches, leave no doubt of the species belonging to the present genus.

3. ***V. cordata*, Wall. Catal. n. 6008 (partly).** Very glabrous and often somewhat glaucous in all its parts, the young stems succulent and disarticulating in the dried specimens. Leaves on rather long petioles, broadly cordate, $2\frac{1}{2}$ to nearly 4 in. long and nearly as broad, entire, except small, almost bristle-like distant teeth, 5-nerved, the smaller veins reticulate, very few or none, transverse, and faintly conspicuous. Flowers in corymbose trichotomous

cymes, the buds about 1 line diameter. Petals 1, usually cohering at the top and falling off together. Style subulate. Berries obovoid-globular.—Benth. Fl. Hongk. 54; *Cissus cordata*, Roxb. Fl. Ind. i. 407; *Vitis cardiophylla*, F. Muell. Fragm. ii. 73.

N. Australia. N. coast, *R. Brown*.

Queensland. Barrow Islands, *McGillivray*; Burdekin river, *F. Mueller*; Rockhampton, *Thozet*. Common in the Archipelago and Eastern India, extending northward to Sikkim and Hongkong.

1. **V. adnata**, *Wall.*; *Wight and Arn. Prod.* 126 (with the synonyms adduced). Young shoots and under side of the leaves more or less covered with a short tomentum, which sometimes disappears with age. Leaves peltiolate, broadly cordate, almost orbicular, acuminate, 3 to 6 in. diameter, bordered with small bristle-like teeth, 5-nerved and pinniveined, the primary veins connected by transverse veinlets. Flowers scarcely $\frac{1}{2}$ line diameter, numerous in corymbose cymes. Petals 4, cohering by the tips and falling off together. Style shortly subulate, at least in the fertile flowers. Fruit globular, small.—*Cissus adnata*, Roxb.; *Wight*, Ic. t. 144.

N. Australia. N. coast, *R. Brown*; Sea Range, very rare, *F. Mueller*. Common in East India.

5. **V. nitens**, *F. Mueller. Fragm.* ii. 73. Quite glabrous. Leaflets 3, ovate or oval-oblong, acuminate, mostly 3 to 4 in. long, remotely toothed, narrowed at the base, the lateral ones scarcely oblique, on short petiolules, rather firm, smooth and shining above. Umbel-like cymes almost glabrous, dense and nearly globular, 2 or 3 together or solitary on a very short common peduncle, the pedicels very short. Flower-buds ovoid, rather more than 1 line long. Petals 4 or rarely 5, oblong, falling off separately. Disk inconspicuous. Style very short and thick, with a broad, flat, almost fringed, slightly 2-lobed stigma. Berry ovoid.

Queensland. E. coast, *R. Brown*; Dawson and Burnett rivers, *F. Mueller*; Brisbane river, *Fraser*, *F. Mueller*.

N. S. Wales. Clarence, Macleay, and Hastings rivers, *Beckler*; Hunter's River, *R. Brown*, *F. Mueller*.

6. **V. saponaria**, *Seem. Syst. List Vit. Pl.* 4. Young leaves and shoots and inflorescence minutely hoary-tomentose. Leaflets 3, very broadly ovate, acuminate, entire or erenate, attaining 4 to 6 in., thin and glabrous when full-grown, pinniveined and more or less distinctly 5-nerved at the base, especially the lateral ones, with transverse veinlets, the central one rounded at the base, the lateral ones obliquely cordate. Cymes loose, divaricate, many-flowered, on long peduncles. Flowers nearly globular, above 1 line diameter. Petals 4, usually falling off together. Disk broad. Style conical. Berry depressed-globular.

Queensland. Torres Straits, *R. Brown*; Cape York and Piper's Island, *McGillivray*. Also in the Fiji Islands, where, according to Seemann, the stems are used in washing linen. A. Gray in *Bot. Amer. Expl. Exped.* i. 272, had referred this plant with doubt to *Cissus geniculata*, Bl., and perhaps correctly so, for although Blume describes the central leaflet as oblong-lanceolate, yet he mentions a broad leaved variety, but with more pubescent leaves. All are closely allied to the common E. Indian *V. pedata*, *Wall.*, and may be a 3-foliate variety of that very variable species.

7. **V. acris**, F. Muell. *Fragm.* ii. 75. Branches and leaves softly pubescent or hairy. Leaflets 3, broadly ovate, acuminate, crenate, 3 to 4 in. long, thin, hairy on both sides, pinniveined with transverse veinlets, the lateral leaflets oblique, obscurely cordate, and more or less 5-nerved at the base, on petioles of $\frac{3}{4}$ to $\frac{1}{2}$ in. Cymes loose and divaricate, on long slender peduncles, the branches almost filiform and nearly glabrous. Flowers nearly globular, about $\frac{1}{2}$ line diameter. Petals 4, apparently distinct. Disk very prominent. Style short, conical.

Queensland. Between Burnett and Pine rivers, F. Mueller.

N. S. Wales. Richmond and Clarence rivers, Beckler.

The foliage is that of *V. mollissima*, Wall., from the Archipelago, from which the species appears to differ chiefly in the very slender inflorescences and small flowers. These may, however, not be full-grown in the very few specimens seen.

8. **V. trifolia**, Linn. *Spec. Pl.* 293. Softly hoary-pubescent all over, especially the young shoots, or sometimes nearly or quite glabrous. Leaflets 3, ovate-acuminate, obovate or rhomboid, usually 1 to 2 in., rarely 3 in. long, coarsely and irregularly toothed or crenate, softly herbaceous, usually thick and sometimes almost fleshy, the lateral ones very oblique, on short petiolules. Cymes many-flowered, divaricate, on long peduncles, hoary or pubescent. Flowers nearly globular, about 1 line diameter. Petals 4, distinct. Disk very prominent. Style in some specimens short with a broad peltate stigma, in others slender with a small stigma. Berry small, depressed-globular. —*Cissus carinosa*, Lam. ; DC. *Prod.* i. 630 ; *C. ciuerea*, Lam. ; DC. *I. c.* 631 ; *C. crenata*, Vahl ; DC. *I. c.* ; *Vitis carinosa*, W. and Arn. *Prod.* 127 ; Wight, *Ic. t.* 171 (a broad-leaved form) ; *V. psoralifolia*, F. Muell. *Fragm.* ii. 75.

N. Australia. N. coast, R. Brown ; Victoria river, F. Mueller ; Albert river, Heane.

Queensland. Cape York, M'Gillivray.

The species is very common in East India and the Archipelago, and is probably described under several names besides those above quoted.

9. **V. clematidea**, F. Muell. *Fragm.* ii. 74. Minutely tomentose, pubescent, or glabrous. Branches angular-striate. Leaflets usually 5, pedate, petiolate, ovate, acuminate, coarsely toothed or lobed, usually 1 to 2 in. long, narrowed at the base, herbaceous, rather thick and pubescent or thin and glabrous. Cymes divaricate, rather dense, on long peduncles, minutely hoary-tomentose. Pedicels short. Flowers globular, about 1 line diameter. Petals apparently separating. Disk very prominent, entire. Style filiform. Berries depressed-globular, small.

Queensland. Brisbane river, Fraser, F. Mueller.

N. S. Wales. Port Jackson, R. Brown ; northward to Clarence river, Beckler ; New England, C. Stuart ; Newcastle, Leichhardt ; southward to Kiama, Harvey.

10. **V. acetosa**, F. Muell. *Herb.* Glabrous or the young shoots and inflorescence very slightly hoary-tomentose. Leaflets 5 to 7, pedate, petiolulate or the central one nearly sessile, oblong or obovate-cuneate, obtuse or rarely shortly acuminate, 2 to 3 in. long or rarely longer, entire or bordered by small teeth or minute distant serratures, narrowed at the base, herbaceous, but rather firm, pale underneath. Cymes pedunculate, dense, divaricate or almost thyrsoid, the flowers often shortly racemose along the branches, on short pedicels. Flowers purple-red, ovoid-globular, about 1 line long,

glabrous. Petals separating. Disk indistinct. Style very shortly conical or scarcely any, with a truncate stigma. Berries ovoid-globose. *Cissus acetosa*, F. Muell. Trans. Vict. Inst. iii. 24.

N. Australia. N. coast, *R. Brown*; Victoria and Fitzmaurice rivers, F. Muell.; Sweers Island, *Horae*. The specimen first described were, according to F. Muell's notes, from tall herbaceous not climbing stems, but others are evidently climbing, with the usual tendrils.

11. **V. hypoglauca**, F. Muell. Pl. Vict. i. 94. Young shoots rusty-tomentose or villous, adult specimens usually quite glabrous. Leaflets 5, digitate, obovate, oval or oblong-elliptical, shortly and often acutely acuminate, 2 to 3 in. long, the lateral ones smaller than the central ones, entire or toothed towards the top, obtuse at the base, on rather long petiolules, coriaceous, pinniveined and finely reticulate, pale or glaucous underneath. Cymes rather dense, shortly pedunculate. Flowers yellowish, glabrous, ovoid, fully 1 line long. Petals separating or slightly cohering. Disk 4-lobed, but not very prominent. Style conical. Berry nearly globular, rather small.—*Cissus hypoglauca*, A. Gray. Bot. Amer. Expl. Exped. i. 272; *C. australasica*, F. Muell. in Trans. Phil. Soc. Vict. i. 8.

N. S. Wales. Port Jackson, *R. Brown*, and others; northward to Clarence river, Beckler; New England, *C. Stuart*; southward to Kiama, Harvey; Twofold Bay, F. Muell.

Victoria. Forest streams and rivulets in eastern Gipps' Land, F. Muell.

12. **V. sterculifolia**, F. Muell. Herb. Fruiting specimens quite glabrous. Leaflets 5, digitate, elliptical-oblong or somewhat obovate, shortly and obtusely acuminate, 3 to 4 in. long, entire, narrowed into a very short petiolule, coriaceous, pinniveined, the reticulate veinlets much less conspicuous than in *V. hypoglauca*, with glands or sacculae in the axils of some of the primary veins underneath. Flowers not seen. Fruiting cymes on short peduncles. Berries ovoid, rather large.

N. S. Wales. Hastings river, Beckler. One specimen has a very young flower-cyme, which is slightly rusty-pubescent, but not far enough advanced to give the floral characters.

13. **V. opaca**, F. Muell. Herb. Quite glabrous. Leaflets 5, rarely 3 or 4, digitate, from linear-cuneate to elliptical-oblong, obovate or narrow rhomboidal, obtuse or acuminate, mostly 1 to 2 in. long, entire or slightly toothed, narrowed at the base into very short petiolules or almost sessile, rather firm but not coriaceous, smooth, obscurely pinniveined, usually pale underneath. Cymes rather loose, but not large. Flowers glabrous, globular, about 1 line diameter. Petals 5 or rarely 4, separating. Disk prominent, entire or scarcely lobed. Style short, conical. Berries depressed-globular.—*Cissus opaca*, F. Muell. in Trans. Vict. Inst. iii. 23.

Queensland. Burdekin river, F. Muell.; Brisbane river, Moreton Bay, Fraser, F. Muell.; Rockhampton, Thozet; Port Denison, Fitzalan; E. coast, *R. Brown* (with the leaves mostly 3-foliate).

14. **V. angustissima**, F. Muell. Fragm. i. 141. Glabrous and rather slender. Leaflets usually 5, digitate, narrow-linear, 1 to 3 in. long, entire, coarsely toothed or lobed, narrowed at the base; occasionally, however, the lower ones are slightly pedate or united into 3 cuneate and coarsely toothed leaflets, or into a single broad palmately-lobed leaf. Cymes compact and

many-flowered, $\frac{1}{2}$ to 1 in. broad, on rather long peduncles. Flowers fully 1 line diameter. Petals 5, separating. Disk broad, undulate. Style short, conical, with a truncate stigma. Berries nearly globular.

W. Australia. *Dreamland*, n. 13 and 218; Murchison river, *Oldfield*. At first sight this closely resembles the S. American *Cissus palmata*, Poir., but that species has more ovoid buds, 4 petals falling off together, and a smaller disk.

2. LEEA, Linn.

Petals united in a campanulate corolla with 5 spreading or recurved lobes. Disk (resembling a staminal tube) cup-shaped, conical, or nearly globular, 5-lobed, enclosing the ovary. Stamens inserted in grooves outside the disk, the filaments incurved at the top, with the anthers inside the disk in the bud. Ovary enclosed in the disk, 3 to 6-celled, with 1 ovule in each cell.—Shrubs or small trees, without tendrils. Leaves once, twice, or thrice pinnate, with large entire or toothed pinnatifid leaflets. Pedicels or cymes 1-af-opposed, corymbose. Flowers usually larger than in *Vitis*.

The genus is dispersed over tropical Asia and Africa, the only Australian species being the most common among the Asiatic ones.

1. **L. sambucina**, *Willd. Spec. Pl.* i. 1177. A tall, glabrous, coarse shrub, the young branches occasionally furrowed. Leaves mostly twice or thrice pinnate; leaflets few in each pinna, from ovate to oblong-elliptical or lanceolate, acuminate, usually 3 to 6 in. long and $1\frac{1}{2}$ to 2 in. broad, but sometimes twice as long, irregularly crenate, the primary arcuate pinnate veins and transverse veinlets very prominent underneath. Cymes large, divariccate, trichotomous, on short peduncles. Flowers about 2 lines long, on very short pedicels. Ovary 5-celled. Berries small, depressed-globular, usually ripening 4 to 6 seeds. —DC. *Prod.* i. 635; *L. staphylea*, Roxb., W. and Arn. *Prod.* 132, with the synonyms adduced; Wight. *Ill. t.* 58 and *Ie. Pl. t.* 78.

N. Australia. Raffles Bay, Goulburn Island, and other points of the N. coast, *A. Cunningham*.

Queensland. Islands of Howick's group, *F. Mueller*.

The species is common in tropical Asia, and is, perhaps, the same as a common African one.

ORDER XXXVIII. SAPINDACEÆ.

Flowers usually polygamous. Sepals 4 or 5, free or united in a small toothed or lobed calyx, imbricate or rarely valvate in the bud. Petals as many as sepals, or 1 fewer, sometimes minute or wanting, frequently bearing a scale inside. Disk various, in some genera unilateral, rarely wanting. Stamens 8, rarely fewer or more, inserted round the ovary within the disk (except in a few genera not Australian), sometimes unilateral; anthers versatile or erect. Ovary entire or lobed, 1- to 4-celled, most frequently 3-celled. Style simple, with a single stigma, or more or less divided. Ovules 1, 2, or rarely more in each cell, ascending, or rarely horizontal, with the micropyle inferior. Fruit dry or succulent, dehiscent or indehiscent, entire or separating into cocci. Seeds with or without an arillus, without albumen (except in a few genera not Australian). Embryo usually thick, frequently folded or

spiral, the cotyledons usually unequal, collateral or superposed; radicle short, turned downwards or reascending towards the hilum. Trees, shrubs, or rarely almost herbaceous, often climbers (especially in genera not Australian). Leaves alternate (or in genera not Australian opposite), usually compound, pinnate with, or more frequently without, a terminal odd one, the leaflets often irregularly alternate, rarely decompound; 3-foliate or simple. Flowers usually small.

Sapindaceæ are abundant within the tropics, both in the New and in the Old World, more rare in the temperate regions of the northern hemisphere, and those, chiefly of the genera *Æsculus*, *Acer*, and their allies, unrepresented in Australia; there are very few also in southern extratropical Africa or America. Of the 16 Australian genera, 6 small ones are endemic or only extend to Timor, and the most numerous, *Dodonæa*, is nearly so, with the exception of 1 or 2 ubiquitous tropical species. Five of the genera are common to the tropical regions of the New and the Old World; the remaining 4 restricted to tropical Asia or extend only into Africa.

The majority of *Sapindaceæ* are readily known by the disk outside, not inside the stamens, and by the 8 stamens in a 5-merous flower, with a 3-merous gynoecium; but all these characters have exceptions, which render the technical limitations of the Order difficult, although really doubtful genera are very few. The position of the micropyle appears to be constant, but often difficult to observe. The arboreous genera with pinnate leaves, often numerous in species, especially in tropical Asia, may require considerable modification as to their characters, and probably some reduction, when those proposed by Blume come to be better known, as well as to flower as fruit.

Flowers irregular, either 1 petal fewer than the sepals, or the stamens or disk unilateral, and ovary excentrical.

One ovule in each cell of the ovary.

Herbaceous or half-herbaceous climber with binate leaflets.

Capsule inflated, membranous

Trees with pinnate leaves. Petals 1 fewer than sepals.

Calyx valvately 5-lobed. Capsule loculicidally 3-valved

Sepals 5, broadly imbricate. Fruit deeply divided into oblong indehiscent lobes

Shrubs or trees, with 1 or 3 digitate leaflets. Sepals 4, broadly imbricate. Petals 4 or none. Fruit of 1 or 2 indehiscent lobes

Two ovules in each cell of the ovary. Low shrubs or undershrubs, with entire, lobed, or pinnately dissected leaves

Flowers regular. Disk annular or none. Stamens all round the ovary.

One ovule in each cell of the ovary. Trees or tall shrubs.

Leaves pinnate (except *Heterodendron* and sometimes in *Atalaya*). Capsule loculicidally 3-valved.

Sepals distinct, broadly imbricate

Calyx small, toothed, or the lobes valvate or slightly imbricate

Fruit separating into winged samaras

Fruit divided into indehiscent or 2-valved lobes or irregularly loculicidal, the valves not separating from the axis.

Leaves pinnate.

Sepals broadly imbricate in 2 rows. Petals usually exserted. Fruit-lobes smooth, indehiscent

Calyx-teeth or lobes valvate or slightly imbricate. Petals very small or none. Fruit-lobes smooth (in Australia), indehiscent or 2-valved

1. CARDIOSPERMUM.

2. DIPLOGLOTTIS.

3. ERIOGLOSSUM.

4. SCHIMIDELIA.

5. DIPLOPELTIS.

6. CUPANIA.

7. RATONIA.

8. ATALAYA.

9. SAPINDUS.

10. NEPHELUM.



1. Flower enlarged 3. Seeds black
 2. Flowers drooping 4. Natural scales

Calyx-segments imbricate. Petals very small or none.
 Fruit-lobes tuberculate or muricate, indehiscent 11. EUPHORIA.
 Leaves coriaceous, simple, entire or pinnatifid. Calyx entire
 or minutely toothed 12. HETERODENDRON.
 Two ovules in each cell of the ovary.
 Trees with pinnate leaves. Petals 4 or 5.
 Calyx deeply divided into imbricate segments. Disk incon-
 spicuous 13. HARPULLIA.
 Calyx campanulate, shortly lobed. Disk broad 14. AKANIA.
 Shrubs or rarely small trees. Leaves simple or pinnate with
 small leaflets. Calyx cup-shaped. Petals none. Disk in-
 conspicuous.
 Stamens in the male flowers 10 or fewer, usually 8 15. DODONEA.
 Stamens in the male flowers more than 10 16. DISTICHOSTEMON.

1. CARDIOSPERMUM, Linn.

Flowers polygamous. Sepals 4, broadly imbricate, the 2 outer ones small. Petals 4, 2 larger with a large scale, 2 smaller with a crested scale. Disk one-sided, almost reduced to 2 prominent glands opposite the lower petals. Stamens 8, oblique. Ovary excentrical, 3-celled, with 1 ovule in each cell; style very short, with 3 stigmatic lobes. Capsule vesicular, membranous, more or less 3-cornered, 3-celled, opening loculicidally. Seeds globose, with a thick funicle or small aril; testa crustaceous; cotyledons large, transversely folded.—Herbs or undershrubs, mostly climbing. Leaves dissected. Flowers few, small, on long axillary peduncles, which usually bear a tendril under the panicle.

A small genus, chiefly American, of which 2 species are also spread over the Old World within the tropics, and a third is perhaps confined to the Old World. The Australian species is one of those most widely diffused in both worlds.

1. **C. Halicacabum**, Linn.: DC. Prod. i. 601. A straggling or somewhat climbing annual or perhaps perennial, attaining several feet in length, glabrous or slightly pubescent. Leaf-segments usually twice ternate, ovate or ovate-lanceolate, coarsely toothed or lobed, the upper leaves smaller, narrower and less divided. Peduncles 2 to 3 in. long, bearing a double or treble short recurved tendril under the small panicle, which is often reduced to an umbel of few small white flowers. Capsules flat on the top, usually pubescent.—A. Gray, Gen. Ill. t. 181; Wight, Ic. t. 508.

N. Australia. Victoria river, Sea range, etc., F. Mueller; Albert river, Heane.

Queensland. N.E. coast, R. Brown; Rockhampton, Thozet.

The species is common in most tropical regions. The Australian specimens belong either to the variety with fruits scarcely 1 in. diameter, often considered as a distinct species (*C. microcarpum*, H. B. and K.), or are intermediate between that and the typical form, with fruits above 1 in. diameter.

2. DIPLOGLOTTIS, Hook. f.

Calyx deeply 5-lobed, valvate. Petals 4, the place of the fifth vacant, the inner scale divided into two. Disk one-sided, crescent-shaped. Stamens 8, ascending, unequal. Ovary 3-celled, style short, incurved; stigma entire or obscurely 3-lobed. Ovules solitary in each cell. Capsule nearly globular, thick, somewhat fleshy, loculicidally 3-valved. Seeds enclosed in a pulpy

arillus.—A tree, with large pinnate leaves, more or less villous-tomentose. Flowers not very small, in large axillary panicles.

The genus is limited to a single species, endemic in Australia.

1. **D. Cunninghamii**, *Hook. f. in Benth. and Hook. Gen. Pl.* 395. A tree of 30 to 40 ft., the young branches, petioles and inflorescence densely clothed with a soft rust-coloured tomentum. Leaves very large, sometimes exceeding 2 ft.; leaflets 8 to 12, opposite or irregularly alternate, oblong-elliptical to ovate-lanceolate, acute or obtuse, usually 6 to 8 in., but sometimes above 1 ft. long, glabrous above, pubescent underneath, with raised parallel pinnate veins. Flowers numerous, on pedicels of 1 to 2 lines, clustered along the branches of the ample panicle. Calyx about $1\frac{1}{2}$ lines long, rusty-tomentose. Petals about as long as the calyx, orbicular, thin, ciliate, the two inner scales not united, about as long as the petal itself, but thicker, and very hairy. Stamens exerted in some specimens, shorter than the petals in others. Fruit about $\frac{1}{2}$ in. diameter, tomentose.—*Cupania Cunninghamii*, *Hook. Bot. Mag.* t. 4470.

Queensland. Brisbane river, *A. Cunningham*; also in *Leichhardt's* collection.

N. S. Wales. Hunter's River, *R. Brown*; Hastings river, *A. Cunningham*, *Fraser*, *Beckler*; Clarence river, *Wilcox*; Illawarra, *Ralston*. With the habit and fruit of a *Cupania*, this plant has the flowers of a *Paullinia*.

3. ERIOGLOSSUM, Blume.

Flowers polygamous. Sepals 5, broadly imbricate, the two outer ones smaller. Petals 4, the place of the fifth vacant, the scale hirsute with a terminal lobed appendage. Disk one-sided, lobed. Stamens 8, turned to one side, unequal. Ovary 3-lobed, 3-celled; style slender, obscurely 3-lobed; ovules solitary in each cell. Fruit divided to the base into 3 oblong indehiscent lobes. Seeds without any arillus; testa membranous, embryo straight; cotyledons thick.—Trees with pinnate leaves, more or less tomentose. Flowers not very small, in cymes or clusters along the branches of terminal panicles.

The genus contains very few species, natives of tropical Asia and Africa; one of the most widely spread extending into Australia. It differs from *Sapindus*, as *Diploglottis* from *Cupania*, in the irregular flowers.

1. **E. edule**, *Blume, Bijdr. and Ramphia*, iii. 119, t. 166. A tall tree, the young shoots, petioles and inflorescence more or less hoary or rusty with a close tomentum. Leaflets 8 to 12, elliptical-oblong or rarely ovate-lanceolate, more or less acuminate, 3 to 4 or rarely 5 in. long, glabrous above, pubescent underneath, with prominent parallel pinnate veins. Flowers numerous. Sepals orbicular, rather thick, pubescent outside, the inner larger ones about $1\frac{1}{2}$ lines diameter. Petals rather longer, the scale shorter than the petal, very hairy in the lower part, the terminal glabrous appendage expanded either into 2 lobes or in a broad fringed erect crest, but very variable. Fruit not seen in the Australian specimens.—*Sapindus rubiginosus*, Roxb. Pl. Corom. i. 44, t. 62; W. and Arn. Prod. 112, with the synonymy quoted.

N. Australia. Brunswick Bay, N.W. coast, *A. Cunningham*. The species is widely spread over tropical Asia and the Indian Archipelago.

4. SCHMIDELIA, Linn.

Flowers polygamous. Sepals 4, broadly imbricate, the outer ones smaller. Petals 4, small, or rarely none. Disk one-sided, usually lobed or divided into 4 glands. Stamens 8, more or less one-sided. Ovary excentrical, 2 or rarely 3-celled; style 2- or 3-lobed; ovules solitary in each cell. Fruit of 1 or rarely 2 small ovoid or globular indehiscent, fleshy or almost dry berries. Seeds with a short arillus; embryo curved, cotyledons folded. Shrubs or trees. Leaves with 1 or 3 leaflets. Flowers very small, in simple or loosely paniculate axillary racemes.

The species are numerous in tropical America, with several African ones, and a few in tropical Asia and the Indian Archipelago, one of the common Asiatic ones extending to Australia. The genus is one of the most easily recognized in the Order, by its foliage as well as by its small flowers and fruits.

1. *S. serrata*, DC. *Prod.* i. 610. A tree, the young leaves and shoots pubescent-tomentose, often glabrous when full-grown. Leaflets 3, ovate or obovate-oblong, obtuse or slightly acuminate, 2 to 4 in. long, irregularly and coarsely toothed, or rarely quite entire, sessile or narrowed into a short petiolule, glabrous above, pale or pubescent underneath, often bearing hairy tufts in the axils of the principal veins. Racemes slender, simple or slightly branched. Flowers $\frac{1}{2}$ to nearly 1 line diameter, on short pedicels, clustered along the pubescent rachis. Petals cuneate, with a minute scale. Disk of 4 small lobes or glands. Stamens glabrous. Berries small, globular.—W. and Arn. *Prod.* 110; *Ornitrophe serrata*, Roxb. *Pl. Corom.* i. 44, t. 61; *S. timoriensis*, DC., Denc. *Herb. Timor.* 115.

2. *Australia*. N. coast, R. Brown; Port Essington, Armstrong. The latter specimens are nearly glabrous, with the leaflets more sessile and narrowed at the base, as described in *S. timoriensis*. Some of R. Brown's are similar; others are more pubescent, like the common form in India, where these characters are very variable; and, as suggested by W. and Arn., these plants may all be varieties only of *S. Colbe*, Linn., which would thus have a very wide range over tropical Asia, including the Archipelago.

5. DIPLOPELTIS, Endl.

Flowers polygamous. Sepals 5, persistent, imbricate in the bud. Petal 4, the place of the fifth vacant, clawed, without any scale inside. Disk very oblique, produced into a concave or apparently double scale. Stamens 8 within the disk, turned to one side. Ovary 2- or 3-lobed, 2- or 3-celled; style ascending, usually twisted; ovules 2 in each cell, superposed halfway up the inner angles. Capsule 2- or 3-celled, opening loculicidally in as many valves or separating into cocci. Seeds usually solitary in each carpel; testa crustaceous; arillus small; embryo spirally rolled. —Shrubs or undershrubs, more or less glandular-pubescent. Leaves alternate, entire or pinnatifid. Panicle terminal, with scorpioid racemes. Flowers white pink or violet, larger than in most *Sapindaceæ*.

The genus is limited to Australia.

Fruit separating into distinct indehiscent cocci.

Leaves ovate or obovate, on distinct, rather long petioles	1. <i>D. petiolari</i> .
Leaves linear, oblong, cuneate, or pinnatifid, narrowed into very short petioles or sessile	2. <i>D. Huegelii</i>

Capsule membranous, loculicidally 3-valved. Leaves linear or cuneate, entire or 3-lobed 3. *D. Stuartii*.

1. ***D. petiolaris*, F. Muell. Herb.** Nearly allied to *D. Huegelii*, of which F. Mueller thinks it may be a variety. Branches, panicles, and both sides of the leaves very glandular, and apparently viscid. Leaves crowded, ovate or obovate, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, irregularly crenate or lobed at the base, on petioles of 3 or 4 lines. Panicle more crowded than in *D. Huegelii*, with smaller flowers. Cocci separating, and similar to those of *D. Huegelii*, except that they are much more glandular and less hairy.

W. Australia. Murchison river, *Oldfield*.

2. ***D. Huegelii*, Endl. in Hueg. Enum. 13.** A shrub of 2 or 3 ft., but flowering also as an undershrub of 1 to $1\frac{1}{2}$ ft., the branches and foliage hoary with a minute tomentum, or softly pubescent or hirsute. Leaves either undivided and from oblong-linear to broadly cuneate, entire or coarsely toothed, or more or less deeply pinnatifid, with short, oblong or cuneate, entire or 2- or 3-toothed lobes or segments, always narrowed at the base but scarcely petiolate. Flowers racemose along the simple branches of a terminal panicle, with a few glandular-tipped hairs on the branches and sometimes on the sepals and ovary; the males and females usually in the same raceme. Sepals broadly ovate, about 1 line long. Petals spreading, on short slender claws, the lamina orbicular, about 3 lines broad, those next the vacancy often smaller than the others. Ovary hirsute with simple and glandular hairs. Fruit separating into 3 rather hard ovoid cocci, about 2 lines long, rugose, usually indehiscent.—Lindl. Bot. Reg. 1839, t. 69; F. Muell. Fragm. iii. 12, Lehmann in Pl. Preiss. ii. 235; *D. Preissii*, Miq. in Pl. Preiss. i. 223 (with pinnatifid leaves); *D. Lehmanni*, Miq. l. c. i. 224 (with entire leaves).

W. Australia. Swan River, *Drummond*, 1st Coll., Preiss, n. 1281 and 1282, and others, and thence to Murchison river, *Drummond*, n. 95, *Oldfield*. I have seen no specimens from King George's Sound or any of the southern districts. The foliage is very variable, and the disk also appears to vary in shape; the inner margin or lobe is, however, generally shorter than the outer one.

Var. (?) *criovarpa*. Apparently diffuse, softly pubescent or hirsute. Leaves deeply pinnatifid with several cuneate, entire or toothed segments. Ovary very hirsute. The young fruit also very hirsute, and, apparently longer, more lobed and more membranous than in the ordinary form, but not seen full-grown.

N. Australia. Nichol Bay, N.W. coast, F. Gregory.

3. ***D. Stuartii*, F. Muell. Fragm. iii. 12.** A shrub apparently diffuse, the branches pubescent and glandular. Leaves linear or cuneate, entire or 3-lobed at the end, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, nearly glabrous above, hirsute underneath. Racemes simple in one specimen, divided into two in the other (both mere fragments), glandular-pubescent and hirsute. Flowers rather smaller than in *D. Huegelii*. Margins or lobes of the disk nearly equal. Ovary very hirsute. Capsule 4 or 5 lines long (3-lobed?), membranous, opening loculicidally in 3 valves.

N. Australia. Between Mount Morphett and Bouy river, *McDonald Stuart* (Herb. F. Muell.)



Buxbaumia repens var. *repens* W. T. A. 5

6. CUPANIA, Linn.

Flowers regular, polygamous. Sepals 4 or 5, imbricate in the bud. Petals either as many as sepals, small, with or without scales inside, or none. Disk usually annular. Stamens usually 8 to 10, inserted inside the disk; filaments short, rarely as long as the calyx. Ovary 2- or 3-celled, rarely 4-celled, with 1 ovule in each cell. Capsule ovoid or rarely globular, coriaceous or hard, 2- or 3-, rarely 4-celled, often angled or lobed, opening loculicidally in as many valves as cells. Seeds usually more or less covered by an arillus; testa crustaceous or coriaceous; embryo curved; cotyledons plano-convex.—Trees or rarely tall shrubs. Leaves alternate, pinnate; leaflets alternate or opposite, with or without a terminal one. Flowers small, in small axillary or terminal panicles, sometimes almost reduced to simple racemes. Petals rarely as long as the sepals.

A large tropical genus, both in the New and the Old World, the precise limits of which are very difficult to fix, and are very differently viewed by different botanists. The Australian species are all endemic, as far as hitherto known.

Sepals orbicular, much imbricate.

Sepals glabrous or ciliate only.

Leaflets obtuse, pale or glaucous underneath. Capsule nearly sessile, deeply 3-lobed	1. <i>C. semiglaucia.</i>
Leaflets acuminate, very oblique, green on both sides. Capsule stipitate, 3-angled	2. <i>C. punctulata.</i>
Leaflets coriaceous, obtuse. Capsule nearly sessile, slightly 3-lobed, very coriaceous	3. <i>C. anacardiooides.</i>

Sepals tomentose.

Leaflets glabrous, acutely serrate	4. <i>C. serrata.</i>
Leaflets tomentose underneath, nearly entire	5. <i>C. tomentella.</i>

Sepals ovate, slightly imbricate. Capsule 3-angled or globular, the valves almost woody.

Leaflets numerous, acuminate, serrate. Capsule very hirsute	6. <i>C. pseudorhus.</i>
Leaflets few, entire or slightly toothed.	

Panicles little-branched or racemes simple. Petals very short and broad. Capsule woody, villous inside.	
Inflorescence often branched, upper male flowers sessile.	

Young shoots and under side of the leaves usually tomentose-pubescent	7. <i>C. xylocarpa.</i>
Racemes simple. Flowers all pedicellate. Leaves glabrous	8. <i>C. nervosa.</i>

Panicles terminal, much branched (though short). Flowers all pedicellate. Petals oblong. Filaments rather long	9. <i>C. Bidwilli.</i>
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1. ***C. semiglaucia*, F. Muell. Herb.** A middle-sized tree. Leaflets 2 to 4 or rarely 6, oblong-elliptical, or from almost obovate to nearly lanceolate, obtuse or rarely almost acute or mucronate, 2 to 3 or rarely nearly 4 in. long, entire, narrowed into a short petiolule, coriaceous, glabrous and somewhat shining above, more or less glaucous underneath. Panicles either small and axillary or terminal and much branched, but shorter than the leaves, glabrous or minutely pubescent. Pedicels short. Sepals orbicular, ciliate, otherwise glabrous, the larger inner ones about 1 line diameter. Petals shorter, with 2 cuneate hairy scales as long as the petal. Stamens exserted. Ovary glabrous, 3-lobed. Capsule 4 to 5 lines diameter, glabrous, very shortly attenuate at the base, with divaricate compressed lobes. Seeds smooth and shining,

with a thin arillus.—*Arytera semiglauca*, F. Muell. in Trans. Vict. Inst. iii. 25.

Queensland. Moreton Bay, *W. Hill*, F. Muell.

N. S. Wales. Hastings and Clarence rivers, *Beckler*; Paramatta, *Woolls*; Blue Mountains, *Miss Atkinson*; S. of the colony, rare, *A. Cunningham*; Kiama, *Harvey*.

2. **C. punctulata**, F. Muell. *Fragn.* iii. 12. A tall shrub, quite glabrous. Leaflets usually 4 to 7, on a long slender common petiole, very obliquely ovate-lanceolate, acuminate, 3 to 4 in. long, quite entire, thinly coriaceous, smooth and shining, minutely pellucid-dotted, narrowed into a petiolule of $\frac{1}{2}$ in. or more. Flowers not seen. Fruiting panicles short, slender, clustered in the axils or at the ends of the branches. Pedicels short. Sepals often persistent or reflexed, orbicular, about 1 line long, glabrous. Capsule glabrous, 3-angled, flat at the top with the remains of the style forming a point in the centre, about 4 lines broad, contracted into a short obconical stipe, half opening in 3 coriaceous valves. Seeds not seen.

Queensland. Cumberland Islands, *Fitzalan*.

3. **C. anacardiooides**, A. Rich. *Sert. Astral.* 33, t. 13. A slender tree, quite glabrous or with a minute hoariness on the inflorescence. Leaflets 6 to 10, usually 8, from broadly ovate or obovate to elliptical-oblong, very obtuse, $2\frac{1}{2}$ to 4 in. long, rounded at the base and shortly petiolulate, quite entire, coriaceous. Flowers rather large for the genus, in pedunculate cymes along the branches of loose panicles. Sepals orbicular, the inner ones 2 lines broad, slightly ciliate. Petals small, orbicular, with 2 very short obovate hirsute scales at the base. Stamens 10; filaments short, hirsute; anthers oblong. Ovary villous. Capsule glabrous, coriaceous, acutely and divaricately 3-lobed, 6 to 8 lines broad, very shortly attenuate at the base.

N. Australia. Port Essington, *Armstrong*.

Queensland. Brisbane river, Moreton Bay, *Fraser*, *A. Cunningham*, F. Muell.; Burdekin river, *F. Muell.*

N. S. Wales. Port Jackson, *R. Brown* and others; Hastings river, *Fraser*, *Beckler*; Clarence river, *Wilcox*.

4. **C. serrata**, F. Muell. *Fragn.* iii. 43. A tree, but flowering when still shrubby, the young branches rusty with a close tomentum. Leaflets usually 6 to 10, ovate-lanceolate or lanceolate, acute or acuminate, 3 to 6 in. long, sharply and coarsely serrate, rounded at the base and nearly sessile, rigid but not thick, shining above, very prominently pinnately veined and reticulate underneath. Panicles in the upper axils, little branched or almost reduced to dense racemes of 2 or 3 in., softly tomentose or pubescent. Flowers rather large, on very short pedicels. Sepals orbicular, the innermost fully 2 lines long. Petals much shorter, broad with a short 2-cleft scale at the base. Anthers 8, oblong, on very short filaments. Ovary in the males rudimentary, villous. Female flowers and fruit not seen.

Queensland. Pine river, Moreton Bay, *W. Hill*.

5. **C. tomentella**, F. Muell. *Herb.* Possibly a variety of *C. serrata*, of which it has the flowers. Branches, petioles, and inflorescence softly tomentose, almost villous. Leaflets 5 to 8, oblong or obovate-oblong, obtuse, 2 to 3 in. long, minutely and remotely denticulate or nearly entire, on petiolules

often 2 lines long, thinly coriaceous, glabrous above, softly tomentose underneath. Panicles not much branched. Bracts rather large, tomentose, deciduous. Flowers nearly sessile. Sepals orbicular, and petals small with a short scale as in *C. serrata*. Anthers oblong, slightly pubescent. Capsule 3-angled, thickly coriaceous, velvety-tomentose and rugose, $\frac{3}{4}$ in. broad.

Queensland. Moreton Bay, *W. Hill.*

6. **C. pseudorhus**, *A. Rich. Sert. Astrol.* 34, *t. 14*. A spreading tree of moderate size, the young branches and petioles densely rusty-tomentose. Leaves crowded under the panicles; leaflets 13 to 21 or even more, lanceolate or ovate-lanceolate, acuminate, 1 $\frac{1}{2}$ to 3 in. long or rarely more, very oblique or almost falcate, nearly glabrous and shining above when full-grown, more or less tomentose or pubescent underneath. Panicles usually much-branched and rather dense, rarely exceeding the leaves, tomentose. Flowers rather small, on very short pedicels. Sepals ovate, less imbricate than in the preceding species, the longest scarcely exceeding 1 line. Petals orbicular, rather exceeding the sepals, the inner scales hirsute, as long as the lamina. Stamens 8 or 9; anthers oblong. Ovary villous. Capsule globular, slightly lobed, almost woody, densely hirsute with short velvety hairs, about $\frac{1}{2}$ in. diameter. Arillus small.

Queensland. Keppel Bay, *R. Brown*; Brisbane river, *Fraser*, *A. Cunningham*, *F. Mueller*; Wide Bay, *Bidwill*; Mackenzie Island, *Wilcox*.

N. S. Wales. Hastings river, *Fraser*, *Beckler*; Clarence river, *Beckler*.

7. **C. xylocarpa**, *A. Cunn. Herb.*; *F. Muell. Trans. Vict. Inst.* iii. 27. A moderate-sized tree, the young branches rusty-tomentose. Leaflets 3 to 6, rarely more or reduced to 2, ovate obovate or elliptical-oblong, obtuse or scarcely acuminate, 2 to 3 in. long or rarely more, slightly and irregularly sinuate-toothed or entire, glabrous and shining above, more or less pubescent underneath or rarely almost glabrous, with hairy tufts almost always conspicuous in the axils of the raised primary veins. Panicles short and little branched, often reduced to simple racemes and rarely above two inches long, shortly tomentose. Flowers small, the upper male ones sessile, the lower hermaphrodite and pedicellate. Sepals ovate, tomentose, under 1 line long, unequal and slightly imbricate. Petals very small, with a minute scale at the base. Stamens 8 to 10; filament's oblong. Ovary tomentose, occasionally 4-merous. Capsule nearly globular, 3-angled, about $\frac{1}{2}$ in. broad, woody, glabrous or minutely tomentose outside, the valves villous inside. Arillus small.

Queensland. Burnett river, *F. Mueller*; Brisbane river, *A. Cunningham*; Logan river, *Fraser*; Curtis Island, *Henne*.

N. S. Wales. Clarence river, *Beckler*. The foliage of this species often closely resembles that of *Nephelium tomentosum*.

8. **C. nervosa**, *F. Muell. in Trans. Vict. Inst.* iii. 27. A moderate-sized tree, the young branches and inflorescence minutely hoary-tomentose, otherwise glabrous. Leaflets 3 to 6, rarely more or reduced to 2, lanceolate or rarely elliptical-oblong, mostly 3 to 6 in. long, sinuate-toothed or entire, glabrous, with very rarely small tufts underneath in the axils of the raised primary veins. Racemes usually simple, axillary, 1 to 2 in. long, the flowers

all pedicellate and larger than in *C. xylocarpa*. Sepals narrow-ovate, slightly imbricate, above 1 line long. Petals very small, with a very short scale. Anthers oblong, hirsute at first, but soon glabrous. Capsule nearly globular, 3-angled, about $\frac{1}{2}$ in. broad, woody, glabrous or nearly so outside, the valves villous inside.

Queensland. Moreton Bay, *F. Mueller*; Rockhampton, *Thozet*; also in *A. Cunningham's* and *Leichhardt's* collections, without the precise station.

N. S. Wales. Richmond river, *C. Moore*; Clarence river, *Beckler*.

Cunningham's and *Leichhardt's* are the only specimens I have seen in flower, the others are in fruit only, and may possibly include some glabrous specimens of *C. xylocarpa*, to which this species is very nearly allied. It is also closely allied to, although not quite identical with, *C. falcata*, *A. Gray*, from the Fiji islands.

9? **C. Bidwilli**, *Benth.* A tree, the young shoots and inflorescence minutely tomentose. Leaves 2 to 4, ovate oblong or ovate-lanceolate, obtuse or scarcely acuminate, 3 to 6 in. long, entire or obscurely sinuate-toothed, glabrous on both sides, with few or no tufts in the axils of the raised primary veins underneath. Panicles terminal, much branched, but shorter than the leaves. Flowers small, all pedicellate. Sepals tomentose, narrow-ovate, slightly imbricate, about 1 line long. Petals rather shorter than the calyx, oblong, concave, with 2 minute hirsute auricle-like scales at the base of the lamina. Stamens about 8; filaments nearly as long as the calyx; anthers oblong. Ovary hirsute. Fruit not seen.

Queensland. Wide Bay, *Bidwill*. Although I have not seen the fruit, this species has all the appearance of a true *Cupania*. It has some general resemblance to a Philippine Island species, n. 1237 of *Cuming*, which is I believe as yet unpublished.

7. RATONIA, DC.

(*Arytera*, *Blume*.)

Flowers regular, polygamous. Calyx small, cup-shaped, 4- or 5-toothed or lobed, open, valvate, or slightly imbricate in the bud. Petals 4 or 5, small, with or without scales inside, or none. Disk usually annular. Stamens 7 to 19, inserted inside the disk; filaments filiform, longer than the calyx. Ovary 2- or 3-celled, with 1 ovule in each cell. Capsule either 2-celled and compressed, or 3-celled and 3-angled or 3-lobed, loculicidally 2- or 3-valved, rarely almost indehiscent. Seeds more or less covered by an arillus; testa crustaceous; cotyledons thick, often curved or folded.—Trees. Leaves alternate, pinnate; leaflets alternate or opposite, usually without a terminal one. Flowers small, in terminal or axillary panicles. Petals rarely as long as the calyx.

A large tropical genus, with the same range as *Cupania*, but especially numerous in America. The Australian species are all endemic. It is closely allied to *Cupania*, with which it is usually joined, but the gamosepalous calyx and long filaments appear to give it at least as great a value as several other generally admitted genera of *Sapindaceæ*.

Capsule distinctly stipitate, 3-angled or pear-shaped. Leaflets coriaceous.

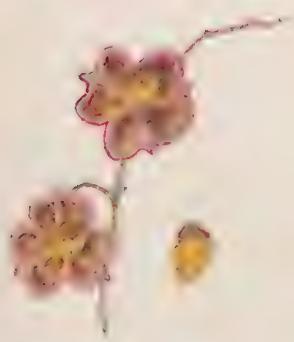
Leaflets large, very coriaceous, the veins scarcely prominent. Petals 5.

Capsule glabrous inside 1. *R. pyriformis*.

Leaflets thinly coriaceous, much reticulate. Petals none. Capsule densely woolly inside 2. *R. anodonta*.

Leaflets oblong-lanceolate, very coriaceous, the margins thickened, primary veins prominent. Capsule glabrous inside 3. *R. stipitata*.





Capsule nearly sessile, flattened and 2-celled or rarely 3-lobed. Leaflets scarcely coriaceous.
 Filaments long, very woolly. Styles united to the middle 4. *R. tenax*.
 Filaments short, slightly hairy. Styles distinct from the base . . . 5. *R. distylis*.

1. **R. pyriformis**, Benth. A tree of considerable size, but flowering sometimes as a shrub, glabrous except a minute hoariness on the young shoots and panicles. Leaflets 3 to 6, ovate or ovate-lanceolate, shortly acuminate, 4 to 6 in. long, entire, very coriaceous, on petiolules of $\frac{1}{2}$ in. or more. Flowers very small, shortly pedicellate, singly or in little cymes of 2 or 3 along the raceme-like branches of the panicle. Calyx nearly 1 line diameter, shortly and broadly 5-lobed. Petals 5, scarcely exceeding the calyx-lobes, cuneate or spatulate, the inner scales lining and bordering the base of the lamina. Stamens in the male flower 8, much exserted, the filaments slightly hirsute, in the females few, with short filaments. Ovary stipitate, slightly hirsute, style filiform, with 3 diverging stigmatic lobes. Capsule globular-pear-shaped, about 4 lines diameter, narrowed into a long stipe, glabrous, with 3 raised ribs, appearing almost drupaceous and scarcely dehiscent. Seeds often reduced to 2 or 1, enclosed in the arillus; cotyledons much folded.—*Schmidelia pyriformis*, F. Muell. *Fragn.* i. 2.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham*, *W. Hill*, *F. Mueller*.

2. **R. anodonta**, Benth. A tree of considerable size, flowering also as a shrub, quite glabrous. Leaflets 2, 3, or rarely 4, ovate or ovate-lanceolate, obtuse or obtusely acuminate, 2 to 4 in. long, coriaceous, but not thick, very much reticulate, narrowed into a petiolule of $\frac{1}{4}$ to nearly $\frac{1}{2}$ in. Panicle glabrous, slender, not much branched. Calyx glabrous, about $\frac{1}{2}$ line diameter. Petals none. Filaments exserted, glabrous. Ovary stipitate, almost glabrous; style shortly subulate, with diverging stigmatic lobes. Capsule pear-shaped, somewhat 3-angled, nearly $\frac{1}{2}$ in. broad, the valves almost woody, densely villous inside. Seeds often reduced to 2 or 1, enclosed in the arillus. Embryo much curved; cotyledons folded, but less so than in *R. pyriformis*. *Schmidelia anodonta*, F. Muell. *Fragn.* i. 2; *Cupania anodonta*, F. Muell. *Fragn.* ii. 76.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham*, *W. Hill*; Mackenzie river, *Leichhardt*.

3. **R. stipitata**, Benth. A moderate-sized tree, glabrous except a minute tomentum on the young branches and inflorescence. Leaflets 3 to 6, oblong-lanceolate, acute, 2 to 3 in. long, narrowed into a petiolule of 3 or 4 lines, coriaceous, very rigid, shining above, the primary veins very prominent underneath. Panicles axillary and terminal, divaricately branched. Flowers not seen. Fruiting pedicels 2 to 3 lines long. Calyx persistent, very small, acutely 1 or 5-lobed. Capsule 3-angled, depressed at the top, $\frac{1}{2}$ in. broad, narrowed into a short but distinct stipe, valves thickly coriaceous, almost woody, glabrous and reddish inside. Seeds shining, in a thin arillus. *Cupania stipata*, F. Muell. *Fragn.* ii. 75 and 175.

N. S. Wales. Clarence river, *Beckler*. I have corrected the specific name to *stipitata*, from the stipitate capsules, *stipata* (encircled) having been probably a clerical error.

4. **R. tenax**, Benth. A moderate-sized tree, quite glabrous except the flowers. Leaflets usually 3, but varying from 2 to 6, from obovate to oblong-

elliptical or lanceolate, obtuse, $1\frac{1}{2}$ to 2 or rarely 3 in. long, much narrowed at the base but scarcely petiolulate, thinly coriaceous, shining above, pale or sometimes slightly glaucous underneath. Panicles small, little branched. Calyx a little above 1 line broad, 5-lobed. Petals small, broad, the scale inside very hairy. Stamens about 8, the exserted filaments woolly-hairy. Ovary stipitate, 2- or rarely 3-celled. Style rather short, with spreading stigmatic lobes. Capsule usually flattened, 2-celled, about $\frac{1}{2}$ in. broad, contracted into a very short stipe; valves thick, densely villous inside. Seeds apparently only half enveloped in the arillus, but much injured in the specimens examined.—*Cupania tenax*, A. Cunn. Herb.

Queensland. Brisbane river, A. Cunningham, W. Hill, F. Mueller; Port Curtis, C. Moore.

5. *R. distylis*, F. Muell. Herb. A tree of considerable height, glabrous, except the inflorescence, and sometimes the very young shoots. Leaflets 2, or sometimes reduced to 1, at the end of a short common petiole, from obovate-oblong to elliptical or lanceolate, obtuse or shortly acuminate, 2 to 3 in. long, narrowed into a short petiolule, thinly coriaceous, reticulate. Panicles small, pubescent, with minute appressed hairs, the females often reduced to simple racemes. Calyx small, broad, shortly 5-toothed. Petals minute, orbicular, with a hairy scale at the base. Filaments shorter than in the other species, especially in the females; anthers rather large, pubescent. Ovary broadly obovate, strigose-pubescent. Styles divided to the base, revolute. Capsule flattish, 2-celled, about $\frac{3}{4}$ in. broad; the valves coriaceous, slightly hairy inside. Seeds not seen.

Queensland. Brisbane river, Moreton Bay, W. Hill; Port Denison, Fitzalan; Bunya Creek Brush, Leichhardt.

8. ATALAYA, Blume.

Flowers regular, polygamous. Sepals 5, much imbricate in the bud. Petals 5, exceeding the sepals, with an inner scale or tuft of hairs. Disk annular. Stamens 8, inserted inside the disk. Ovary 3-celled, with 1 ovule in each cell. Style short, undivided. Fruit separating into 3 distinct carpels or samarae, 1-celled, 1-seeded and indehiscent at the base, terminating in a long wing. Seeds without any arillus, testa coriaceous; cotyledons thick, unequal.—Trees or shrubs. Leaves pinnate or rarely simple. Flowers usually larger than in *Cupania* and *Ratonia*, in axillary or terminal panicles.

The genus is endemic in Australia, with the exception of one species, which extends to Timor. The flowers are nearly those of *Sapindus*, with the fruit of *Thespesia* and *Acer*.

Flowers and fruit, as well as the whole plant, quite glabrous 1. *A. salicifolia*.
Flowers and fruit more or less pubescent or tomentose.

Leaflets ovate or broadly oblong, the petiole not winged. Panicle pedunculate, many-flowered. Carpels divaricate 2. *A. multiflora*.
Leaflets narrow-oblong or linear, or leaves undivided, the petiole often winged. Carpels diverging.

Plant glabrous, except the flowers 3. *A. hemiglaucia*.
Branches, young leaves, and panicles velvety-tomentose. Leaflets and petiole-wings much reticulate 4. *A. variifolia*.

1. **A. salicifolia**, Blume, *Rumphia*, iii. 186. A small tree, quite glabrous, green or somewhat glaucous. Leaflets in our specimens 2 to 5, oblong or oblong-lanceolate, 3 to 5 in. long, narrowed at the base, but not petiolulate, thinly coriaceous, with numerous pinnate veins, and more or less reticulate, the margins not thickened. Panicles loose, perfectly glabrous, as well as the flowers, except a few hairs on the filaments and petal-scales. Flowers otherwise those of *A. hemiglaucia*. Samarae about $\frac{1}{2}$ to 1 in. long, including the wing, and perfectly glabrous. — *Sapindus salicifolius*, DC. Prod. i. 608; *Cupania salicifolia*, DCne. Herb. Tim. Deser. 115; *Thouinia australis*, A. Rich. Sert. Astral. 31, t. 12.

N. Australia. Careening Bay, N.W. coast, *A. Cunningham*; Melville Island (not Moreton Bay), *Fraser* and *A. Cunningham*. Also in Timor, the specimens precisely similar to the Australian ones.

2. **A. multiflora**, Benth. A tall shrub or small tree, glabrous except the inflorescence. Leaflets 2 to 6, ovate or oblong, very obtuse, 2 to 3 in. long or rarely more, distinctly petiolulate, coriaceous and strongly reticulate. Panicle pedunculate above the last leaves, oblong or pyramidal, minutely tomentose-pubescent. Flowers very numerous, the small scale-like bracts more conspicuous than in the other species. Flowers of *A. hemiglaucia*. Ovary slightly pubescent. Samarae 1 to $1\frac{1}{2}$ in. long, including the straight or falcate wing, very divaricate, pubescent or nearly glabrous.

Queensland. Cape York and Trinity Island, *McGillivray*; Brisbane river, *W. H. Hell*, *F. Mueller*.

3. **A. hemiglaucia**, F. Muell. Herb. A tall shrub or small tree, quite glabrous except the flowers, and more or less glaucous. Leaves usually pinnate; leaflets few, from narrow-oblong to linear, obtuse or scarcely acute, from 2 or 3 to 7 or 8 in. long, often somewhat falcate, narrowed at the base but rarely petiolulate, rigidly coriaceous, with numerous pinnate and reticulate veins and a somewhat thickened margin, the common petiole terete or nearly so; sometimes, however, the petiole becomes winged, or the leaves are quite simple, oblong, or linear, or the leaflets are decurrent on the petiole forming a large 2- or 3-lobed leaf, or rarely the simple leaf is ovate-lanceolate, and 8 to 10 in. long. Panicles rather dense, the rhachis and branches glabrous or nearly so; pedicels 1 to 2 lines long. Sepals orbicular, nearly glabrous, $1\frac{1}{2}$ or the inner ones nearly 2 lines long. Petals pubescent, oblong, 3 to 4 lines long, with a hirsute scale at the base. Filaments pubescent. Ovary densely silky-pubescent. Samarae pubescent, with minute appressed hairs, 1 to $1\frac{1}{2}$ in. long, including the wing, which is nearly as broad as long, the cavity hairy or nearly glabrous inside. — *Thouinia hemiglaucia*, F. Muell. Fragm. i. 98.

N. Australia. N.W. coast, *Bynoe*; Hammersley Range, Nichol Bay, *F. Gregory*; Albert river, *Henne*.

Queensland. E. coast, *R. Brown*; Oxley's Station, *Leichhardt*; Rockhampton, *Thozet*; Brisbane river, *A. Cunningham*, *Fraser*; Mooni river, *Mitchell*.

N. S. Wales. Liverpool plains, *A. Cunningham*; Bowen and Castlereagh rivers, *F. Mueller*; desert of the Darling, and thence to Stokes range and Cooper's Creek, *Victorian Expedition* and others.

4. **A. variifolia**, F. Muell. Herb. A tall shrub or small tree, the young

branches and panicles softly velvety-tomentose. Leaves or leaflets from oblong to linear, apparently as variable as in *A. hemiglauca*, but longer, often above 8 in., very much more reticulate, the common petiole usually broadly winged, the wing also much reticulate. Panicle loose. Sepals silky-pubescent, about 1½ lines long. Petals twice as long. Filaments hairy. Samara softly tomentose, 2 in. long including the wing, which is fully twice as long as broad, the cavity pubescent inside.—*Thouinia rufijolia*, F. Muell. Fragm. i. 46.

N. Australia. Sea range, Macadam range, and near Fitzmaurice river, F. Mueller.

9. SAPINDUS, Linn.

Flowers regular, polygamous. Sepals 4 or 5, much imbricate in the bud. Petals as many, usually exceeding the sepals, with 1 or 2 inner scales or without any. Disk annular. Stamens usually 8 to 10. Ovary 2- to 4-lobed, 2- to 4-celled, with 1 ovule in each cell. Style with 2 to 4 stigmatic lobes. Fruit fleshy or coriaceous, divided into 2 to 4 globular or ovoid indehiscent lobes, not muricate. Seeds without any arillus; embryo straight or curved; cotyledons thick.—Trees or shrubs, rarely climbing. Leaves pinnate, rarely 1-foliate. Flowers in terminal or axillary panicles.

The genus is widely dispersed over tropical regions, but less numerous in America than in Asia. The Australian species is, as far as known, endemic; but, like many others of the genus, it must remain in some measure doubtful until the fruit has been seen.

1. S. (?) australis, Benth. Young branches, petioles, and panicles pale or hoary with a very minute tomentum. Leaflets, in our specimens, 4 or 6, broadly ovate, obtuse, 3 to 5 in. long, entire, often oblique, narrowed into a short petiolule, coriaceous, glabrous, much veined, of a pale, almost glaucous colour. Panicle loose, longer than the leaves. Flowers shortly pedicellate, in little loose cymes along the divaricate branches. Sepals in the male flowers, the only ones seen, hoary-tomentose, rather above 1 line long. Petals nearly 2 lines long, oval-oblong, narrowed into a short claw, pubescent outside, with a single short broad scale inside fringed with long hairs. Stamens usually 8, as long as the petals. Filaments hairy.

Queensland. Cape York, M'Gillivray. In the absence of female flowers and fruit, I have referred this plant to *Sapindus*, from its general resemblance in habit and male flowers to *S. emarginatus*, Roxb.

10. NEPHELIUM, Linn.

Flowers regular, polygamous. Calyx small, cup-shaped, with 4 or 5 rarely 6 teeth or lobes, valvate or slightly imbricate in the bud. Petals none, or as many as calyx-lobes, small, with a 2-elephant scale or 2 scales inside. Disk annular. Stamens 6 to 10, inserted within the disk; filaments in the Australian species short, in others elongated. Ovary 2- or 3-celled, usually lobed, with 1 ovule in each cell. Style with 2 or 3 stigmatic lobes. Fruit usually deeply 2- or 3-lobed, or rarely entire, 2- or 3-celled, or reduced to a single carpel, the lobes indehiscent or 2-valved, or opening irregularly, muricate, or in the Australian species smooth. Seeds usually wholly or partially enclosed in an arillus; testa coriaceous; cotyledons thick.—Trees, with the habit of *Cupania*. Leaves abruptly pinnate; leaflets opposite or alternate, the pri-



Setaria



Malvaceae - Tiliaceae - Malvaceae

many parallel pinnate veins prominent underneath in all the Australian species except *N. microphyllum*. Flowers small, in axillary or terminal panicles.

The genus extends over tropical Asia, especially the Archipelago. The Australian species are all endemic, and differ from the majority of the Asiatic ones in their smooth fruit and shorter filaments. The flowers are nearly those of *Ratma*; but the frait does not open in septiferous valves, even when, as in *N. connatum*, it is scarcely lobed. It is also very nearly allied to *Euphoria*, differing chiefly in the smaller coriaceous calyx. The distinctions, however, between *Cupania*, *Ratma*, *Nephelium*, *Euphoria*, and several others, are very slight.

Carpels quite connate, the capsule not depressed in the centre between them.

Leaflets slightly hoary or pubescent. Panicle much-branched, many-flowered. Petals 5. Capsule scarcely coriaceous.

1. *N. connatum*.

Leaflets rigid, glabrous, mostly toothed. Panicles scarcely branched. Petals none. Capsule very coriaceous

2. *N. subdentatum*.

Carpels globular, the capsule depressed in the centre and deeply lobed.

3. *N. tomentosum*.

Fruit densely villous. Leaflets 4 or more, mostly toothed, tomentose-villous underneath

4. *N. coriaceum*.

Fruit minutely hoary. Leaflets 2, entire, coriaceous, glaucous underneath

5. *N. foveolatum*.

Fruit thickly coriaceous, nearly glabrous outside, very hairy inside.

6. *N. leiocarpum*.

Panicle very tomentose. Leaflets glabrous

7. *N. Beckleri*.

Fruit thinly coriaceous, glabrous. Panicle nearly glabrous. Leaflets quite glabrous

8. *N. divaricatum*.

Carpels ovoid, united only by their attenuated bases.

9. *N. microphyllum*.

Leaflets 4 or 6, with few, parallel, prominent veins (as in all the preceding species). Panicles loose, many-flowered.

Calyx divided to the base into imbricate segments

Calyx divided to the middle into broad obtuse lobes

Leaflets 2, small, with numerous, scarcely prominent veins. Panicles short

1. ***N. connatum*, F. Muell. Herb.** A tree of 20 to 40 ft., the young shoots and inflorescence minutely hoary-tomentose. Leaflets 2 to 6, from obovate to oblong-lanceolate, obtuse, $2\frac{1}{2}$ to 4 in. long, narrowed at the base, but scarcely petiolulate, quite entire or very obscurely sinuate, thinly coriaceous, glabrous and shining above, somewhat glaucous or minutely tomentose underneath. Flowers small and numerous, in pyramidal panicles rarely exceeding the leaves. Calyx 5-lobed, about 1 line diameter. Petals about $\frac{1}{2}$ line long, the inner scale as long as the lamina. Filaments short; anthers exserted, oblong, pubescent. Ovary 3-celled; style thickened at the base. Fruit 3-surfaced or 3-lobed, but not deeply so, mucronate, and not depressed in the centre, somewhat inflated, scarcely coriaceous, hoary, indehiscent or splitting irregularly. Seeds small, shining, black, in a bright red cupular arillus. *Spanogheia connata*, F. Muell. in Trans. Viet. Inst. iii. 26.

Queensland. Keppel Bay, R. Brown; Brisbane river, Moreton Bay, A. Cunningham, W. Hill, F. Muell.; Port Denison, Fitzalan. This is certainly the *Sapindus cicerurus*, A. Cunningham, referred to by A. Gray, in Bot. Amer. Expl. Exped. i. 258; but the plant from Hunter's River, more especially described by A. Gray, with coarsely serrate leaves and glabrous bracts, is probably different.

2. ***N. subdentatum*, F. Muell.** (as a var. of *N. connatum*). A tall shrub or small tree, the young shoots and inflorescence slightly pubescent

with minute appressed hairs. Leaflets 2 to 6, ovate or ovate-lanceolate, obtuse or scarcely acute, irregularly sinuate-toothed or rarely almost entire, coriaceous, glabrous on both sides and shining above. Panicles short, little branched. Pedicels short. Calyx truncate or shortly and broadly lobed. Petals none. Filaments very short; anthers oblong, scarcely pubescent. Ovary tomentose, 2- or 3-celled; fruit truncate at the top, slightly hoary with a minute tomentum, the lobes, usually 2 only, compressed-globular, united to the top, hard and indehiscent.

N. S. Wales. Tenterfield, New England, *C. Stuart*; "Tarampa Hill," *Leichhardt*. F. Mueller thinks that this may be a glabrescent form of *N. coriaceum*, but there is a considerable difference in general aspect; the calyx is more open and less lobed, I can find no petals, and the fruit is differently shaped.

3. *N. tomentosum*, F. Muell. in *Trans. Vict. Inst.* ii. 64. A tree of 20 to 30 ft., the young branches and petioles clothed with a soft rust-coloured velvety tomentum. Leaflets 4 to 8, from oval-oblong to oblong-lanceolate, acute, or rarely obtuse, 2 to 4 in. long, acutely toothed or rarely almost entire, thinly coriaceous, pubescent above or at length glabrous, tomentose-pubescent underneath. Flowers small, crowded, on short slightly-branched tomentose panicles, sometimes reduced to simple racemes. Pedicels very short. Calyx nearly 1 line long, the lobes rather deep and acute. Petals none. Filaments very short; anthers oblong, exserted, glabrous or slightly pubescent. Ovary tomentose, 2- or 3-lobed; style short, with spreading stigmas. Fruit softly tomentose-villous, depressed at the top, of 2 or rarely 3 globular slightly compressed lobes, united to the top, 4 or 5 lines diameter, rather hard, indehiscent. Seeds half immersed in a yellowish arillus.

Queensland. Bremer river, Moreton Bay, *A. Cunningham*, *W. Hill*, *F. Mueller*.

N. S. Wales. Clarence river, *Wilcox*, *Beckler*.

4. *N. coriaceum*, Benth. Young branches slightly hoary with a very minute tomentum. Leaflets in our specimens always 2, obovate-oblong or elliptical, 2½ to 4 in. long, very obtuse, quite entire, coriaceous, glabrous and shining above, pale or glaucous underneath, rounded at the base, on a short petiolule. Flowers not seen. Fruiting panicle branched, shorter than the leaves. Calyx small, with rather acute lobes. Fruits hoary-tomentose, mostly 3-lobed, much depressed in the centre, the lobes nearly globular, coriaceous, indehiscent.

Queensland. Brisbane river, *Fraser*.

5. *N. foveolatum*, F. Muell. Herb. A tree of considerable size, the young branches and inflorescence rusty-tomentose. Leaflets 4 to 6, ovate-lanceolate, or almost ovate, obtuse or acuminate, 3 to 5 in. long, entire or sinuate-toothed, narrowed into a distinct petiolule of 1 to 3 lines, thinly coriaceous, glabrous or rarely slightly pubescent underneath, having frequently a cup-shaped cavity in the axils of the primary veins. Panicles in the upper axils broad and many-flowered but shorter than the leaves, the flowers in little clusters or cymes along the principal branches. Calyx tomentose, deeply divided into lanceolate lobes of nearly 1 line, valvate in the bud. Petals minute or rudimentary. Filaments nearly as long as the calyx; anthers oblong, pubescent. Fruit tomentose, deeply divided into 2, 3, or sometimes

4 ovoid lobes, attaining sometimes $\frac{1}{2}$ in., opening in 2 thickly coriaceous valves. Seeds completely enveloped in the arillus. — *Arytera foveolata*, F. Muell. in Trans. Vict. Inst. iii. 24.

Queensland. Moreton Bay, W. Hill, F. Mueller.

6. **N. leiocarpum**, F. Muell. Herb. A tall tree, usually glabrous except a very slight pubescence on the young leaves and shoots, and sometimes on the panicles. Leaflets 2 to 6, mostly oblong-elliptical, ovate-lanceolate or lanceolate, acuminate or obtuse, 3 to 4 or even 5 in. long, but more variable in size and shape than in most species, entire or rarely with a few deep serratures, narrowed into a very short petiolule, not coriaceous. Panicles loose, not much branched, usually glabrous. Calyx about 1 line diameter, with very short broad teeth. Petals broad and short but variable, the scale usually nearly as long as the lamination. Filaments often exceeding the calyx; anthers oblong, glabrous or nearly so. Fruit sessile or nearly so, glabrous, with distinct globular lobes of 4 to 5 lines diameter, coriaceous, indehiscent or opening irregularly in a longitudinal slit, or breaking off transversely. Seed deeply enclosed in the arillus. — *Spanogheia nepheloides*, F. Muell. in Trans. Vict. Inst. iii. 25.

Queensland. Brisbane river, F. Mueller; Curtis Island, Henne (a var. with smaller more obtuse and more coriaceous leaflets).

N. S. Wales. Port Jackson, R. Brown; northward to Hastings river, Fraser, Beckler; Richmond river, C. Moore; Macleay and Clarence rivers, Beckler; southward to Illawarra, A. Cunningham, Backhouse; Kiama, Harvey; Two-fold Bay, F. Mueller.

7. **N. Beckleri**, Benth. A tree of considerable size, the young shoots and inflorescence slightly hoary with a minute tomentum, otherwise glabrous. Leaflets 3 to 6, ovate-lanceolate or oblong, obtuse or obtusely acuminate, 2 to 4 in. or when luxuriant 6 in. long, entire, narrowed into a petiolule of 3 to 6 lines, thinly coriaceous, quite glabrous. Panicles much branched. Flowers numerous, shortly pedicellate. Calyx pubescent, deeply divided into 5 orbicular or broadly-ovate very obtuse segments about $\frac{1}{2}$ line long. Petals in the males short, with a very small scale, in the females longer with a more developed scale. Filaments very short; anthers oblong, pubescent. Fruit distinctly stipitate, glabrous, with 2 or 3 horizontally divaricate ovoid lobes of about $\frac{1}{2}$ in., either indehiscent or rarely opening in a short slit; often reduced to a single perfect lobe, the two others forming short tubercles at its base.

N. S. Wales. Clarence river, Beckler. The calyx is more deeply cleft and more imbricate than in any other *Nephelium*, thus approaching that of *Euphoria*; but the species is too closely allied in fruit and other characters to *N. divaricatum* to be generically separated from it.

8. **N. divaricatum**, F. Muell. Herb. A handsome tree of considerable height, the young shoots and panicles slightly hoary with a minute tomentum, otherwise glabrous. Leaflets 4 or rarely 2, oval-oblong, elliptical or oblong-lanceolate, obtuse or acuminate, 2 to 3 or rarely 4 in. long, entire, narrowed into a petiolule of 2 or 3 lines, thinly coriaceous. Panicles loose, with few divaricate branches, the flower-cymes shortly pedunculate. Calyx very open, about $\frac{1}{2}$ line long, pubescent, divided to the middle into 5 or rarely 4 broad obtuse lobes. Petals small, the inner scale short or in some females nearly

as long as the lamina. Filaments short; anthers oblong, pubescent. Ovary tomentose. Fruit glabrous, sessile or nearly so, with 1, 2, or 3 ovoid or nearly globular lobes, indehiscent or splitting longitudinally, more or less villous inside. Seed nearly enveloped in the arillus.—*Arytera divaricata*, F. Muell. in Trans. Vict. Inst. iii. 25.

Queensland. Brisbane river, Moreton Bay, A. Cunningham, W. Hill, F. Muell.; Pine river, Fitzalan.

9. *N. microphyllum*, Benth. Glabrous or the young shoots minutely hoary. Leaflets 2 or rarely 1 only, ovate or obovate, obtuse, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, entire, narrowed at the base but not petiolulate, somewhat coriaceous, the primary veins numerous and fine, not distant and raised as in other species. Flowers not seen. Fruiting panicles short and rather dense. Calyx small, 5-lobed. Fruit glabrous, almost sessile, with 1, 2, or rarely 3 ovoid lobes, about 5 lines long, splitting irregularly like those of *N. divaricatum*, hirsute inside.

Queensland. Wide Bay, Bidwill.

There are in R. Brown's herbarium specimens in flowers only, from Hunter's River, of what appears to be a *Nephelium* or *Cupania*, different from any of those above described; but, in the absence of fruit, I am unable to satisfy myself as to which genus it should be referred to, and therefore refrain from publishing it.

11. EUPHORIA, Juss.

Flowers regular, polygamous. Sepals 5, distinct, imbricate or valvate in the bud. Petals none or as many as sepals, with or without a scale inside. Disk annular. Stamens 6 to 10, inserted within the disk; filaments short. Ovary 2- or 3-celled, usually lobed, with 1 ovule in each cell; style deeply 2- or 3-lobed, or divided to the base into distinct styles. Fruit deeply 2- or 3-lobed, or reduced to a single carpel, the lobes usually indehiscent, tuberculate. Seeds enclosed in a pulpy arillus; testa coriaceous; cotyledons thick.—Trees, with the young shoots usually pubescent. Leaves pinnate; leaflets, as in *Nephelium*, with the primary pinnate veins raised underneath. Flowers small, in terminal panicles.

The genus extends over tropical Asia, especially the Archipelago, with one Australian endemic species. It is very nearly allied to *Nephelium*, differing chiefly in the distinct sepals (in which respect *N. Beckleyi* comes very near to *Euphoria*), and from the Australian *Nephelia* in the tuberculate fruit.

1. *E. Leichhardtii*, Benth. Young branches, petioles, and inflorescence rusty-tomentose. Leaflets about 6, from obovate-oblong to ovate-lanceolate, obtuse or acuminate, 2 to 3 in. long, entire, rather thin, glabrous or nearly so above, tomentose or pubescent underneath, narrowed into a short petiolule. Panicles terminal, sessile, rather large, the flowers in little dense cymes along its branches. Sepals about 1 line long, tomentose, imbricate. Petals rather shorter, without any scale, but hairy inside, glabrous outside in the typical form. Filaments longer than the calyx; anthers ovoid. Ovary 3-celled. Style rather thick, with 3 divergent lobes. Young fruit deeply divided into 3 globular lobes, very tomentose and tuberculate, but not seen fully formed.

Queensland (?), Leichhardt (Herb. F. Muell.).

Var. *hirsutipetala*. Calyx rather smaller. Petals pubescent outside. "Nurram Nurram," Leichhardt (Herb. F. Muell.).



12. HETERODENDRON, Desf.

Flowers regular, usually hermaphrodite. Calyx broadly cup-shaped, very shortly and irregularly toothed. Petals none. Disk small. Stamens 6 to 15, inserted within or upon the disk; anthers nearly sessile, longer than the calyx. Ovary 2- to 4-lobed, 2- to 4-celled, with 1 ovule in each cell; style short, with an obtuse lobed stigma. Fruit of 1 or 2, rarely 3 or 4 coriaceous or hard lobes, indehiscent. Seed half immersed in an arillus; testa crustaceous; cotyledons thick, flexuose.—Shrubs. Leaves simple, entire or lobed. Flowers small, in short terminal, slightly-branched panicles, often reduced to simple racemes.

The genus is limited to Australia.

Leaves entire, coriaceous, linear, oblong or rarely obovate, usually above 2 in. long 1. *H. oleæfolium*.
 Leaves entire, mucronate, toothed or pinnatifid, scarcely coriaceous,
 rarely 2 in. long 2. *H. diversifolium*.

1. ***H. oleæfolium***, Desf. in *Mem. Mus. Par.* iv. 8, t. 3. A tall shrub, the young shoots hoary or glaucous with a minute silvery pubescence. Leaves linear, lanceolate or narrow-oblong, rarely almost obovate, acute or obtuse, 2 to 4 in. long, quite entire, narrowed into a very short petiole, coriaceous and sometimes very rigid. Panicles usually few-flowered and much shorter than the leaves. Calyx broadly cup-shaped, varying from $1\frac{1}{2}$ to nearly 3 lines diameter. Ovary usually 3- or 4-celled, densely tomentose. Fruit of 1, 2, or very rarely 3 or 4 nearly globular lobes, 3 or 4 lines diameter.—DC. *Prod. ii.* 92; F. Muell. *Pl. Vict.* i. 90.

N. Australia. Hammersley range, near Nichol Bay, *F. Gregory's Expedition*.

Queensland. Burdekin river, *F. Mueller*; Bowen river and Connor's Creek, *Leichhardt*.

N. S. Wales. N.W. interior, *Strutt*; Mount Boggan, *A. Cunningham*; plains of the Gwydir, *Mitchell*; Macquarie river and desert of the Darling and Murray, *Herb. F. Mueller*.

Victoria. Mallee scrub, on the rivers Murray, Wimmera, and Avoca, *F. Mueller*.

S. Australia. Lake Torrens, Flinders Range, and Cooper's Creek, *F. Mueller*.

W. Australia. Dirk Hartog's Island, *A. Cunningham*; Milne; Murchison river, *Oldfield*.

The Queensland specimens have smaller and more glabrous flowers than the more southern ones, with the ovary usually 2-carpellary. The north-western and some of the western ones have much broader leaves and more abundant flowers than the eastern.

2. ***H. diversifolium***, *F. Muell. Fragm.* i. 46. A shrub, the young branches tomentose, pubescent, or perfectly glabrous. Leaves from linear-cuneate to oblong-cuneate or almost obovate, rarely 2 in. long and often under 1 in., usually mucronate with an almost pungent point, either entire or with a few sharp teeth or lobes towards the end, or pinnatifid with the triangular pungent lobes rigid and sometimes coriaceous, but less so than *H. oleæfolium*. Flowers few, in short panicles, pubescent or glabrous. Ovary 2-celled. Fruit-lobes very divaricate, ovoid, glabrous or tomentose.

Queensland. Keppel Bay, *R. Brown*; thickets at the foot of the dividing range, *A. Cunningham*; Rockhampton, *Thozet*; Warwick, *Beekster*; Comet river, *Leichhardt*.

There are two forms, one perfectly glabrous, the other with the young shoots and flowers pubescent, the fruit densely pubescent or tomentose. The specimens I have seen, although rather numerous, are not good.

13. **HARPULLIA**, Roxb.

Flowers regular, polygamous. Sepals 4 or 5. Petals as many, without any scale, but sometimes with inflected auricles at the base of the lamina. Disk inconspicuous. Stamens 5 to 8. Ovary 2-celled, with 2 ovules in each cell; style short, or elongated and spirally twisted. Capsule coriaceous, somewhat compressed, with 2 turgid lobes opening loculicidally in 2 valves. Seeds 1 or 2 in each cell, with or without an arillus; cotyledons thick.—Trees. Leaves pinnate; leaflets usually large, the primary veins prominent underneath. Flowers in loose terminal little-branched panicles, sometimes reduced to simple racemes. Capsules usually large, red or orange-coloured.

Besides the Australian species, which are endemic, there are two or three others, natives of tropical Asia or Madagascar.

Calyx persistent. Petals not auriculate.

Petiole winged. Leaflets coarsely toothed 1. *H. alata*.

Petiole not winged. Leaflets entire.

Leaflets coriaceous, very obtuse 2. *H. Hillii*.

Leaflets membranous, shortly acuminate 3. *H. Leichhardtii*.

Calyx deciduous. Petals with inflected auricles 4. *H. pendula*.

1. ***H. alata***, F. Muell. *Fragn.* ii. 103. A tall tree, the young branches and panicles minutely tomentose, otherwise glabrous. Leaflets usually 6 to 10, oblong-elliptical or lanceolate, acutely acuminate and coarsely toothed, almost lobed, 3 to 6 in. long, or more in the large leaves of barren shoots, rather rigid, green and much veined on both sides, the common petiole broadly winged. Panicles short, loose. Flowers few, larger than in the other species, on short pedicels. Sepals persistent, about 3 lines long, shortly tomentose. Petals about 4 lines long, oblong-cuneate, narrowed at the base, and not auricled. Stamens 7 or 8, about as long as the sepals in the males, shorter in the females. Capsule 1 to 1½ in. broad, coriaceous, nearly glabrous inside. Seeds enveloped in a yellowish arillus.

N. S. Wales. Clarence river, Beckler; Richmond river, C. Moore.

2. ***H. Hillii***, F. Muell. in *Trans. Vict. Inst.* iii. 26, and *Fragn.* ii. 104. A tree of 60 to 80 ft., the young branches and inflorescence rusty with a close tomentum, otherwise glabrous. Leaflets usually 5 to 11, broadly oblong or oval-oblong, very obtuse, 3 to 5 in. long, or more in the large leaves of barren shoots, thinly coriaceous, shining, the common petiole not winged. Panicles loose, little branched, shorter than the leaves. Pedicels 2 to 3 lines long. Sepals persistent, broadly ovate, 2 to 3 lines long. Petals oblong, 3 to 4 lines long, without auricles. Male flowers not seen. Stamens in the females 5 or 6, with very short filaments and acute anthers, probably imperfect. Capsule 1½ in. broad, slightly tomentose outside, the turgid lobes hirsute inside. Seeds in the young state showing no arillus, but, according to Beckler, of an orange-yellow when ripe and enclosed in a rich red membrane.

Queensland. Wide Bay, Bidwill; Moreton Bay, W. Hill; Mackenzie river, Leichhardt.

N. S. Wales. Richmond river, Beckler; Clarence river, C. Moore.

3. ***H. Leichhardtii***, F. Muell. *Herb.* Young shoots and inflorescence









F. Mueller direxit

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Harpullia Wadsworthii

minutely hoary-tomentose, otherwise glabrous. Leaflets in the single specimen seen 10, elliptical, 3 to 5 in. long, membranous as in *H. pendula*. Panicles almost reduced to simple racemes. Flowers all females, on pedicels of 3 to 5 lines. Sepals persistent, tomentose, about 2 lines long. Petals and stamens already fallen away. Ovary tomentose, already enlarged, but the fruit not fully formed.

N. Australia. Port Essington, *Leichhardt*. Although the specimen is very incomplete, it is evidently a distinct species, with the foliage nearly of *H. pendula*, and the persistent calyx of *H. Hillii*.

4. **H. pendula**, *Planch.*; *F. Muell.* in *Trans. Vict. Inst.* iii. 26, and *Fragn.* ii. 104. A tall tree, glabrous or the young shoots and panicles minutely hoary-tomentose. Leaflets 3 to 6, or rarely more, from ovate to elliptical-oblong, obtusely acuminate, 3 to 5 in. long, membranous. Panicles loose and slender. Pedicels in flower 3 to 4 lines, in fruit $\frac{1}{2}$ to 1 in. long, slender. Sepals deciduous, about 2 lines long. Petals ovate, nearly 3 lines long, with inflected ciliate auricles at the base, representing the inner scales of many other *Sapindaceæ*. Stamens 5 to 7, much longer than the calyx, with slender filaments in the males, small and short in the females. Ovary tomentose, with a long style twisted at the top. Capsule glabrous or slightly pubescent, 1 to $1\frac{1}{2}$ in. broad, the lobes inflated. Seeds apparently without any arillus.

Queensland. Moreton Bay, known as "Tulipwood," *Fraser*, *A. Cunningham*; Wide Bay, *C. Moore*; Port Denison, *Fitzalan*; Broad Sound, *Thozet*.

N. S. Wales. Clarence river, *Beckler*; Richmond river, *C. Moore*.

14. AKANIA, Hook. f.

Flowers regular, hermaphrodite (or polygamous?). Calyx campanulate, with 5 short lobes, imbricate in the bud. Petals 5, without any inner scale, Disk adnate to the base of the calyx. Stamens 5 to 10, inserted within the disk. Ovary 3-celled, contracted into a thickish style, with a capitate stigma; ovules 2 in each cell. Fruit not seen.—Tree. Leaves pinnate. Panicles loose, axillary or terminal.

The genus is limited to a single species, endemic in Australia, allied to *Harpullia*, but very different in the calyx and disk.

1. **A. Hillii**, *Hook. f.* in *Benth.* and *Hook. Gen. Pl.* 409. An elegant tree of 30 to 40 ft., glabrous except the panicle. Leaves often above 2 ft. long; leaflets numerous, lanceolate, acutely acuminate, often above 8 in. long, bordered with acute often pungent serratures, rounded at the base and shortly petiolulate, coriaceous, light green, shining above, marked underneath (in the dried state) within each areola of the smaller reticulations with 3 or 4 round ovate or reniform dots. Panicles long, loose, and little branched. Pedicels long and slender. Calyx tomentose, about 2 lines long, the lobes rounded, with thin edges. Petals inserted near the base of the calyx outside the disk. Anthers oblong.—*Cupania lucens*, *F. Muell.* *Fragn.* iii. 14.

Queensland. Moreton Bay, *Leichhardt*; Pine river, *W. Hill*.

N. S. Wales. Clarence river, *Beckler*; Richmond river, *C. Moore*.

15. DODONÆA, Linn.

(Empleurosma, Bartl.)

Flowers polygamous or unisexual, often diœcious. Sepals 5 or sometimes fewer, valvate in the bud. Petals none. Disk small or inconspicuous. Stamens usually 8, sometimes fewer, rarely 10; filaments very short, anthers ovoid or linear-oblong. Ovary 3- or 4-, rarely 5- or 6-celled, with 2 ovules in each cell; style short or, in some flowers, very long, shortly lobed at the end. Capsule membranous or coriaceous, opening septicidally in as many valves as cells, each valve with a dorsal angle often produced into a vertical wing, and in falling off leaving the dissepiment attached to the persistent axis, or rarely the dissepiment splitting and remaining attached to the valves, thus closing the carpels and leaving only the central filiform axis persistent. Seeds 1 or 2, nearly globular or more frequently compressed, with a thickened funicle, but not arillate; testa crustaceous; embryo spirally curled.—Shrubs, often tall, but scarcely truly arborescent; the young shoots usually viscid, and often the whole plant. Leaves simple or pinnate, with small leaflets, with or without a terminal odd one. Flowers terminal or axillary by the abortion of the flowering branches, solitary, clustered, or in short racemes or panicles.

With the exception of *D. viscosa*, which is widely dispersed over almost all hot countries, and possibly one distinct Sandwich Island species, one from S. Africa, and one or two from Mexico, the *Dodonæas* are all endemic in Australia, and very difficult to distinguish by positive characters. The form of the wings of the capsule, which has been much relied on, is as variable as that of the leaves, and the species, which at first sight appear the most distinct, often pass one into the other by the most insensible gradations. Even the exceptional dehiscence of the capsule, in those species where the dissepiments are carried off with the valves, appears sometimes to be not quite constant, and is at most a purely artificial character separating species in all other respects very closely allied. Several species have in some, occasionally in nearly all the female flowers, a remarkably long style, sometimes $\frac{1}{2}$ to 1 in., whilst other female flowers on the same specimen, or on other specimens of the same species, have no style at all, the stigma or stigmatic surface sessile on the ovary.

SERIES I. **Cycloptere.**—Leaves entire, toothed, or rarely lobed. Wings of the capsule extending from the base to the style or nearly so, each carpel, including its wing, nearly orbicular or longer than broad.

Leaves flat, elliptical, oblong-lanceolate or spatulate or, if linear, not filiform, entire or obscurely sinuate, usually above 2 in. long, rarely between 1 and 2 in.

Young branches very angular. Seeds smooth and shining. Leaf-veins indistinct.

Sepals minute. Anthers linear

1. *D. triquetra.*

Sepals 1 to $1\frac{1}{2}$ lines long, from half as long to as long as the anthers

2. *D. lanceolata.*

Young branches very angular. Seeds opaque. Leaves long and narrow, often serrate

12. *D. ptarmicifolia.*

Young branches terete or slightly angular. Seeds opaque.

Leaves oval-oblong, on a rather long petiole, rounded at the base

3. *D. petiolaris.*

Leaves narrowed into the petiole, the lateral veins more or less conspicuous.

Leaves elliptical-oblong, lanceolate or spatulate, rarely almost linear-cuneate

4. *D. viscosa.*

Leaves narrow, linear-cuneate or long and linear

5. *D. attenuata.*

Leaves flat, more or less cuneate, entire or toothed at the end, rarely exceeding $1\frac{1}{2}$ in., and usually under 1 in.

Much-branched, erect or divaricate shrubs. Terminal flowers clustered or shortly racemose.

Leaves broad-cuneate, rounded or truncate at the end

6. *D. cuneata*.

Leaves narrow-cuneate, rather acute, acuminate or 3-toothed at the end

7. *D. peduncularis*.

Prostrate shrub. Leaves rather narrow-cuneate, mostly toothed or lobed. Flowers solitary

8. *D. procumbens*.

Leaves linear-filiform, heath-like or pine-like.

Leaves crowded, under 1 in. long

9. *D. ericifolia*.

Leaves 1 to 3 in. long, not crowded

10. *D. filifolia*.

Leaves linear or lanceolate, mostly serrate or pinnatifid.

Branches terete or nearly so. Leaves linear or linear-cuneate, obtuse, mostly under $1\frac{1}{2}$ in. long

11. *D. lobulata*.

Branches very angular. Leaves linear-lanceolate, acute, mostly 2 to 4 in. long

12. *D. ptarmicifolia*.

SERIES II. *Platyptera*.—Leaves quite entire, flat. Wings of the capsule very divergent or divaricate, not reaching to the style nor to the base, each carpel, including its wing, broader than long, transversely ovate or oblong.

Leaves linear or lanceolate. Branches very angular. Dissepiments persisting on the axis

13. *D. truncatiales*.

Dissepiments splitting and coming off with the valves.

Leaves oblong-elliptical

14. *D. platyptera*.

Leaves narrow-linear

15. *D. stenophylla*.

SERIES III. *Cornutæ*.—Leaves entire or toothed at the end, the margins revolute or rarely flat. Wings of the capsule reduced to erect or divergent, usually falcate, horn-like appendages at the upper outer angle of the carpels.

Leaves narrow-linear or subulate

16. *D. pinifolia*.

Leaves oblong or oblong-cuneate, obtuse, $\frac{1}{2}$ to 1 in. long

17. *D. ceratocarpa*.

Leaves linear or cuneate, acute or 3-toothed, 2 to 4 lines long

18. *D. divaricata*.

Leaves broadly ovate or orbicular, mostly toothed

22. *D. Baueri*.

SERIES IV. *Aptere*.—Leaves entire or toothed. Capsule without wings, or the angles slightly and irregularly dilated into very narrow wings.

Leaves flat, cuneate or obovate, rigid.

Sepals lanceolate. Buds ovoid or globular.

Dissepiments persisting on the axis of the fruit.

Branches scarcely angled. Leaves obovate, cuneate, or triangular, glabrous or pubescent. Flowers mostly axillary.

Sepals narrow, short

19. *D. triangularis*.

Branches acutely angled. Leaves obovate, glabrous. Racemes short, terminal. Sepals broad-lanceolate

20. *D. aptera*.

Dissepiments splitting and coming off with the valves. Branches terete. Leaves obovate or oblong, glabrous

21. *D. bursarifolia*.

Sepals broad-ovate. Buds very angular.

Erect divaricate shrub. Leaves obovate or orbicular, usually toothed

22. *D. Baueri*.

Prostrate shrub. Leaves oblong-cuneate, often 3-toothed

23. *D. humifusa*.

Leaves short, linear, with recurved or revolute margins.

Quite glabrous. Stamens usually 6

24. *D. hexandra*.

Hoary-tomentose, at least the capsules, rarely almost glabrous.

Stamens usually 8

25. *D. ericoides*.

SERIES V. *Pinnatae*.—Leaves all pinnate or very rarely a few simple ones at the base of the branches. Capsule of the Cycloptera, except in *D. oxyptera* and *D. inaequifolia*, where it approaches that of the *Platyptera*, and in *D. humilis*, where it is apterous.

Tall shrubs or small trees. Leaflets flat, oblong, lanceolate or obovate, not coriaceous. Racemes or panicles terminal, loose.

Leaflets usually numerous, lanceolate or oblong. Capsule not inflated, the wings broad.

Leaflets $\frac{1}{2}$ in. or less; rhachis scarcely winged. Sepals 3 to 4 lines long 26. *D. polyzyga*.

Leaflets $\frac{1}{2}$ to 1 in.; rhachis broadly winged. Sepals 1 to $1\frac{1}{2}$ lines 27. *D. neozzyga*.

Leaflets few, obovate or oblong. Capsule large and inflated 28. *D. physocarpa*.

Much-branched, leafy shrubs. Pedicels solitary or clustered (racemose in *D. multijuga* and *D. pinnata*).

Leaflets obovate, cuneate or oblong, often toothed, the margins usually recurved or revolute. Plant usually pubescent or villosus (except *D. humilis*).

Capsule winged, hirsute at least when young.

Villous. Leaflets 7 to 20 or more; rhachis winged. Sepals acuminate. Capsule-wings rounded.

Pedicels long, clustered 29. *D. vestita*.

Pedicels very short. Raceme terminal 30. *D. pinnata*.

Pubescent. Leaflets 3 to 7; rhachis angular. Pedicels short. Sepals obtuse. Capsule-wings acutangular 31. *D. oxyptera*.

Capsule not winged, covered with long, glandular setæ. Leaflets deeply toothed, glabrous. Flowers in dense corymbose clusters 32. *D. humilis*.

Capsule winged, glabrous or very sparingly pubescent. Plant pubescent or rarely glabrous.

Leaflets usually under 11. Pedicels short, clustered 33. *D. boroniaefolia*.

Leaflets usually above 15. Flowers racemose.

Racemes loose. Pedicels slender 34. *D. multijuga*.

Racemes dense. Pedicels very short 30. *D. pinnata*.

Leaflets linear-terete or linear-oblong. Plant glabrous, viscid.

Leaflets linear-oblong, flat, numerous. Capsules broadly winged 35. *D. lerræoides*.

Leaflets narrow-linear, convex underneath. Capsules small.

Capsule-wings very divaricate; dissepiments remaining on the axis. Leaflets above 15 36. *D. inæquifolia*.

Capsule-wings rounded; dissepiments splitting and coming off with the valves. Leaflets under 15 37. *D. adenophora*.

Leaflets almost terete, not thicker than the common petiole. Capsules rather large, the wings rounded.

Leaflets few, distant. Pedicels solitary 38. *D. stenozyga*.

Leaflets several, crowded. Pedicels shortly racemose 39. *D. concinna*.

(*D. heterophylla*, Colla, and *D. seabra*, Lodd., inserted in Steud. Nom. Bot. ed. 2, as Australian plants, are unknown to me, nor can I find any description of them. They are probably garden names given to some of the species here enumerated.)

SERIES I. CYCLOPTERÆ.—Leaves entire, toothed, or rarely lobed. Wings of the capsule extending from the base to the style, or nearly so; each carpel, including its wing, nearly orbicular, or longer than broad. Dissepiments persistent on the axis.

In the following 12 species, great as is the diversity in the size of the capsule and the precise shape of the wings, these differences afford no specific characters, and are often very difficult to class as varieties, even when perfectly ripe and well-formed capsules are obtained; and the shape of the wing often alters much during growth, or is apparently affected by the manner in which the capsule has ripened. The very shining seeds distinguish 2 species, but where they are usually opaque they sometimes are somewhat shining. There remains little but the very uncertain character derived from foliage to separate all these species, which are yet much too constantly dissimilar to be united into one.

1. **D. triquetra**, Andr. Bot. Rep. t. 230. Erect, usually tall, glabrous,

not very viscid, the young branches flattened or angular. Leaves from oval-elliptical to oblong-lanceolate, acuminate, 2 to 3 or rarely 4 in. long, the pinnate and reticulate veinlets few and fine, usually scarcely conspicuous. Pedicels slender, in short, oblong, compact panicles or racemes. Sepals minute, rarely $\frac{1}{2}$ line long. Anthers linear, often $1\frac{1}{2}$ lines long. Styles, when long, attaining $\frac{1}{2}$ in. Capsule of *D. viscosa*, usually middle-sized. Seeds brown, very smooth and shining.—DC. Prod. i. 617; F. Muell. Fragm. i. 73, and Pl. Viet. i. 226.—*D. laurina*, Sieb. in Spreng. Syst. Cur. Post. 152.—*D. longipes*, G. Don, Gen. Syst. i. 674 (from the character given).

Queensland. Brisbane river, Moreton Bay, *Fraser, Fitzalan.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber*, n. 271 and 272, and others; northward to Clarence and Hastings rivers, *Beckler*, and New England, *C. Stuart*; southward to Twofold Bay, *F. Mueller*.

Victoria. Barren declivities and granite rocks of Genoa Peak, and elsewhere in the vicinity of Genoa river, *F. Mueller*.

The Fiji Island plant referred by A. Gray and Seemann to *D. triquetra*, appears to me to be one of the common forms of *D. viscosa*.

2. **D. lanceolata**, *F. Muell. Fragm.* i. 73. Very closely allied to *D. triquetra*, with the same angular branches, smooth, almost veinless leaves, slender pedicels, and very shining seeds, and scarcely distinguishable except by the sepals, which are from 1 to $1\frac{1}{2}$ lines long. The leaves are perhaps generally rather narrower, and the capsule-wings broader, but neither of these characters can be relied upon.

N. Australia. Capstan Island, N.W. coast, *A. Cunningham* (the specimens rather doubtful, not being in fruit); Victoria river and Sea range, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Northumberland Islands, *R. Brown*; Cape Cleveland, *A. Cunningham*; Sunday Island, *M'Gillivray*; Palm Island, *Henne*; Port Denison, *Fitzalan*.

N. S. Wales. Clarence river, *Beckler*.

3? **D. petiolaris**, *F. Muell. Fragm.* iii. 13. The single fragment in F. Mueller's herbarium has a few small oval-oblong leaves, veined as in *D. viscosa*, but much less narrowed at the base, on petioles of 2 or 3 lines. The single capsule is not yet full-grown, but, in that state, does not appear at all different from the larger varieties of *D. viscosa*, of which this plant may probably prove to be a variety.

N. S. Wales. Desert on the Darling river, *Neilson (Hb. F. Muell.)*.

4. **D. viscosa**, Linn.; DC. Prod. i. 616. A shrub, sometimes low and stunted, more frequently tall, glabrous, and usually more or less viscid, the young branches frequently compressed or somewhat triangular, but much less so than in *D. triquetra*. Leaves simple, varying from broadly oblong-lanceolate, acute or acuminate, and 3 or 4 in. long, to narrow-lanceolate, or oblong-cuneate and very obtuse or almost linear-cuneate, always narrowed into a more or less distinct petiole, entire or obscurely sinuate, or rarely almost 3-toothed at the end, the pinnate veins usually rather numerous and very divergent, sometimes scarcely conspicuous. Panicles or racemes usually short and terminal, or reduced to axillary clusters. Sepals ovate, usually as long as or rather longer than the oblong obtuse anthers. Style rarely lengthened out. Capsule very variable in size, the wings continued from the base to the

style, or nearly so, either equally rounded at the top and at the base or more contracted at the base. Seeds rather large, dark-coloured or black, opaque or scarcely shining. — Hook. f. Fl. Tasm. i. 55; F. Muell. Pl. Viet. i. 85.

N. Australia. Apparently rare, but some specimens from the N.W. coast, *Bynoe*, probably belong to this species.

Queensland. Cumberland Islands, *P. Brown*; Endeavour river, *Banks*; Roald's Bay and Rockingham Bay, *A. Cunningham*; Cape Upstart and Port Curtis, *M'Gillivray*; Rockhampton, *Thozet*; Moreton Bay, *Fraser*, *A. Cunningham*, and others.

N. S. Wales. From the borders of Queensland, *Beckler*, *C. Stuart*, and others, to Twofold Bay, *F. Mueller*.

Victoria. Rocky, scrubby, stony, and sandy localities, widely and copiously distributed over the colony, *F. Mueller*.

Tasmania. Common in poor soil, especially near the coast, *J. D. Hooker*.

S. Australia. Apparently common, at least in the eastern parts of the colony, *Herb. Mueller*, and others.

W. Australia. Blackwood river, *Oldfield*.

The species is abundantly distributed over tropical America, Africa, and Asia, extending to the Pacific Islands, and southward, beyond the tropics, to S. Africa and New Zealand. It includes probably the whole of the extra-Australian described *Dodonæa*, except, perhaps, the *D. evansiae* from the Sandwich Islands, *D. Thwaitesiana*, Eick, and Zeyh., from S. Africa, and one or two Mexican ones, which, whether varieties or species, do not occur in Australia. The almost protean forms the species assumes in Australia, even after deducting *D. attenuata*, *D. cuneata*, and *D. megazyga*, which F. Mueller unites with it, are very difficult to distribute into definite varieties, although at least the three following are usually considered as species.

a. vulgaris. Usually tall. Leaves large, obovate-oblong, broadly lanceolate or lanceolate, acuminate or rarely obtuse, the pinnate veins usually numerous and prominent. Capsules large, with rather broad wings, much rounded above and at the base, the terminal sinus between 2 opposite wings narrow, each carpel, including its wing, longer than broad. *D. viscosa*, Linn., and *D. Burmanniana*, DC.; Griseb. Fl. Brit. W. Ind. 127, with the synonyms adduced; A. Gray, Gen. Ill. t. 182; Wight, Illustr. t. 52.—The most common form in America and tropical Africa, extending in Asia as far north as Scinde and Afghanistan, also in the Pacific islands, and to this form belong most of the tropical Australian species as well as some from Hastings river, *Beckler*. Some specimens from Endeavour river, both in the Banksian and in Cunningham's collections, are remarkable for their thick, obscurely veined leaves.

b. angustifolia. Leaves narrow-lanceolate, mostly long and acutely acuminate, much narrowed at the base, the veins usually conspicuous. Capsules small, with very broad wings, leaving the terminal sinus very open and sometimes narrowed at the base, each carpel, including its wing, orbicular or rather broader than long, although much less so than in the *Platystere*. *D. angustifolia*, Swartz, Griseb. Fl. Brit. W. Ind. 128, with the synonyms adduced, Linn. Ill. t. 304, n. 2, and consequently *D. solieriifolia*, DC. Prod. i. 617, supposed to be from New Holland; *D. aerifolia*, A. Cunn. in A. Gray, Bot. Am. Expl. Exped. i. 262. This variety has, early the same range within the tropics as the large-fruited one, and occasionally is found to pass into it. In Australia it includes many Queensland specimens, and is the common form in N. S. Wales collections. It occurs also in W. Australia, but in Victoria, S. Australia, and Tasmania, as in N. Zealand, it tends rather to pass into the spatulate-leaved form. *D. usitata* and *D. Kingii*, G. Don, Gen. Syst. i. 674, from the characters given, belong probably to this variety.

c. spathulata. Usually a more bushy and not so tall a shrub as the preceding varieties, often very viscid. Leaves shorter (although much longer than in *D. cuneata*), obovate-oblong, oblong-acute, spatulate, oblanceolate or broadly linear-acute, usually obtuse or sometimes truncate, the lateral veins usually conspicuous, but in some thick-leaved specimens scarcely more so than in *D. cuneata*. Capsules very variable, but generally intermediate between those of the var. *vulgaris* and *angustifolia*, but nearer to the former. *D. spathulata*, Sm. in Rees, Cycl. xii.; DC. Prod. i. 616; *D. conferta*, G. Don, Gen. Syst. i. 674; *D.*

viscosa, var. *asplenifolia*, Hook. f. Fl. Tasm. i. 55.—This is the commonest, perhaps the only form, in Victoria, Tasmania, and S. Australia, and I have seen N. S. Wales specimens from Port Jackson, and northward to New England, Mount Mitchell, and Mount Aiton. It is the prevalent form in New Zealand, and some of the Sandwich Island specimens can be precisely matched in Australia. *D. oblongifolia*, Link, as figured in Bot. Reg. t. 1051, appears to represent rather a short-leaved form of this variety than a long-leaved *D. cuneata*. *D. asplenifolia*, Rudge, in Trans. Linn. Soc. xi. 297, t. 20, DC. Prod. i. 617, judging from N. S. Wales specimens agreeing with the figure, although not authentically named, is an apparently rare form with linear-cuneate, 3-toothed leaves, resembling those of luxuriant drawn-up shoots of *D. cuneata*, but longer.

5. **D. attenuata**, A. Cunn. in Field, N. S. Wales, 353. A viscid shrub, closely resembling the narrowest-leaved forms of *D. viscosa* on the one hand, and almost passing into *D. lobulata* on the other. Leaves linear or narrowly linear-cuneate, obtuse, often slightly sinuate-toothed, rather thick and rigid, 1-nerved, the lateral veins inconspicuous, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long in the original form, but sometimes longer. Flowers and ovate sepals of *D. viscosa*, in short usually simple racemes. Capsule of *D. viscosa*, usually intermediate between the extremes of the varieties *a* and *b* of that species. Seeds opaque.—Bot. Mag. t. 2860; *D. Preissiana*, Miq. in Pl. Preiss. i. 226; F. Muell. Fragm. i. 72.

N. S. Wales. Blue Mountains, A. Cunningham and others, and apparently common westward in the Darling and Murray desert, Mutarie ranges, Mount Brown, etc., *Herb. F. Mueller*.

Victoria. In the Murray desert and N.W. interior, *F. Mueller*.

S. Australia. Towards Spencer's Gulf, *Warburton*.

W. Australia. Mount Hardy, near York, *Preiss.* n. 2437; between Swan River and King George's Sound, *Drummond*, 4th Coll., n. 257; in the interior, *Roe*. The latter specimens have narrower, more rigid wings to the capsule, and more coriaceous leaves.

Var. linearis. Leaves long, narrow-linear, mostly acute, rigid, the margins often recurved. Capsule (only seen in few specimens) rather small, but with the terminal sinus between the wings narrow.—New England, *C. Stuart*; Mitta-Mitta, Genoa and Buchan rivers in Victoria, *F. Mueller*; Kangaroo Island, *Waterhouse*, *Scaly*; Swan River, *Drummond*, n. 203. The foliage nearly resembles that of *D. stenophylla*, which has a very different capsule.

6. **D. cuneata**, Rudge, in Trans. Linn. Soc. xi. 296, t. 19. A much-branched bushy shrub, glabrous, and usually viscid. Leaves obovate or cuneate, usually $\frac{1}{2}$ to 1 in. long and rather broad, rarely narrow-cuneate, attaining $1\frac{1}{2}$ in., rounded, truncate, emarginate or 3-toothed at the end, otherwise entire or rarely obscurely toothed, gradually narrowed into a very short petiole, thin or coriaceous; the lateral veins rarely conspicuous. Racemes short, terminal, scarcely branched, with slender pedicels, or the flowers few in axillary clusters. Sepals ovate-oblong, and capsules of *D. viscosa*, the wings usually not very broad and rather rigid, with the terminal sinus open.—DC. Prod. i. 617.

Queensland. Burnet river and Moreton Bay, *F. Mueller*.

N. S. Wales. Port Jackson, R. Brown and others; Blue Mountains, *Miss Atkinson*; Darling and Murray desert, *Victorian Expedition*.

Victoria. In the Grampians and Buffalo ranges, Wimmera and Murray rivers, *F. Mueller*, including a var. *coriacea*, with small, obovate, coriaceous leaves and small capsules with broad wings, and a var. *rigida*, with small, rigid, mostly obovate leaves, short pedicels, and rather large capsules with narrow wings. Luxuriant narrow-leaved N. S. Wales speci-

mers occasionally almost pass into some unusual forms of *D. viscosa spathulata*, and the smaller forms come very near to *D. peduncularis*.

7. ***D. peduncularis***, *Lindl.* in *Mitch. Trop. Austr.* 361. A very much branched glabrous and viscid shrub, closely allied to *D. cuneata*, the smaller branches terete, slender but rigid. Leaves from linear-cuneate to broadly spathulate, either acute or very shortly acuminate or rounded or truncate at the end, and often 3-toothed, $\frac{1}{4}$ to $\frac{1}{2}$ in., or very rarely (when narrow) 1 in. long, coriaceous and rigid, 1-nerved, the margins often thickened, the lateral veins inconspicuous. Pedicels rather slender, mostly axillary, solitary or clustered, or in short terminal racemes. Sepals ovate, thicker than in *D. cuneata*. Capsule of *D. viscosa*.—*D. pubescens*, *Lindl.* in *Mitch. Trop. Austr.* 342 (the supposed pubescence apparently a mistake).

Queensland. Near Lindley's Range and on the Maranoa, *Mitchell*.

N. S. Wales. Eurylean scrub in the N.W. interior, Liverpool plains, Hastings river, etc., *Fraser*, *A. Cunningham*.

8. ***D. procumbens***, *F. Muell.* in *Trans. Vict. Inst.* i. 8, and *Pl. Vict.* i. 86. A low, diffuse or prostrate, much-branched shrub, glabrous and scarcely viscid. Leaves crowded, linear-cuneate, spathulate or almost triangular, mostly acute and often coarsely 3- to 5-toothed or lobed, about $\frac{1}{2}$ or rarely $\frac{3}{4}$ in. long, coriaceous, 1-nerved, the lateral veins usually inconspicuous. Flowers mostly solitary, on short terminal pedicels. Sepals lanceolate. Style much more frequently elongated than in other species, often attaining nearly 1 in. Capsule oblong, the angles produced into wings rounded at the top and base as in *D. viscosa*, but much narrower and not so thin. Seeds not seen.

Victoria. Subalpine and boggy plains, at the base of Mount Sturgeon and Mount Abrupt, and stony barren ridges near Snowy River, *F. Mueller*; also in *Mitchell's 1st Coll.*

S. Australia. Clayey banks, eighteen miles W. of Glenelg river, *Robertson*.

F. Mueller describes the capsules as wingless, probably considering the wings, on account of their thickness, as angles of the capsule; but they appear to me in this respect very much like those of the rigid varieties of *D. cuneata*. These wings are indeed the chief character, besides the narrower sepals, to separate this species from *D. humifusa*.

9. ***D. ericifolia***, *G. Don*, *Gen. Syst.* i. 674. A heath-like, low but erect shrub, with numerous virgate branches, glabrous and sometimes viscid. Leaves usually crowded, narrow-linear, rather obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, nerveless and sometimes almost filiform. Flowers few, in very short racemes or clusters in the upper axils or terminating short branchlets. Sepals lanceolate, shorter than the anthers. Capsule of *D. viscosa*, with rather broad wings. Seeds opaque.—*D. salsolifolia*, *A. Cann.* in *Hook. Journ. Bot.* i. 251; *Hook. f. Fl. Tasm.* i. 55.

Tasmania. Port Dalrymple, *R. Brown*; banks of rivers, etc., Launceston, New Norfolk, etc., not uncommon, *J. D. Hooker*. The station, Port Jackson, usually given on the authority of plants raised in Kew Gardens, is, I believe, erroneous; the seeds were probably from *Fraser*, who gathered the plant on the S. Esk river in Tasmania. *D. filiformis*, *Link*, *DC. Prod.* i. 617, a garden plant of unknown origin, may be the same species, but too imperfectly characterized to justify the taking up the name.

10. ***D. filifolia***, *Hook.* in *Mitch. Trop. Austr.* 241. Erect, glabrous, and slightly viscid; branches slender, terete or scarcely angular. Leaves narrow-linear, almost filiform, terete or slightly flattened, often incurved, ob-

ture or scarcely mucronate, 1 to 3 in. long, quite entire. Racemes very few-flowered, the pedicels rather long. Sepals lanceolate, about as long as the anthers. Capsule of *D. viscosa*. *D. acerosa*, Lindl. in Mitch. Trop. Austr. 273; F. Muell. Fragm. i. 71.

Queensland. Newcastle ranges, between the Surat and Burdekin rivers, *F. Mueller*; stony gullies near Mount Mudge, *Mitchell*.

11. **D. lobulata**, *F. Mueller* in *Lianea*, xxv. 372. Closely allied on the one hand to *D. attenuata* and on the other to *D. ptarmicifolia*, glabrous and viscid, the branchlets scarcely angular. Leaves linear or linear-cuneate, obtuse, mostly 1 to 2 in. long, obtusely serrate or pinnatifid with short obtuse callous lobes, coriaceous and rigid, the midrib scarcely conspicuous. Flowers few, in short racemes, the pedicels rather slender. Sepals thin, broadly ovate. Capsule of the smaller forms of *D. viscosa*, the wings not very broad. Seeds smooth and shining.

N. S. Wales. Lachlan river, *Fraser*, *A. Cunningham*; between the Lachlan and Darling rivers, *Burkitt*; Mutanie ranges and Mount Goginga, *Victorian Expedition*.

S. Australia. S. coast, *R. Brown*; Flinders and Elder's ranges, *F. Mueller*.

W. Australia. In the interior, *Roe*. There are also some specimens of Drummond's which may belong to this species, with several of the leaves deeply 2- or 3-lobed, but they are evidently abnormal, the flowers being also monstrous with deformed stamens.

12. **D. ptarmicifolia**, *Turez.* in *Bull. Mus.* 1852, ii. 155. A tall shrub, glabrous and sometimes very viscid, the young branches very angular. Leaves linear-lanceolate, acuminate, acute or with a callous tip, from $1\frac{1}{2}$ to 2 in. long in some specimens, 4 to 5 in. in others, sinuate-toothed, serrate or sometimes entire, gradually narrowed into a petiole, 1-nerved, the lateral veins inconspicuous. Flowers usually rather numerous, in short terminal racemes or panicles. Sepals ovate, about as long as the obtuse anthers. Capsule as in the var. *angustifolia* of *D. viscosa*, rather small, with broad wings, the terminal sinus rather open. Seeds opaque.—*D. denticulata*, *F. Mueller*. Fragm. i. 97.

W. Australia, Drummond, 5th Coll. n. 248, Gardner river, *Herb. F. Mueller* (with short, regularly serrate leaves); Kojonrup Valley, *Herb. F. Mueller* (with long sinuate-toothed leaves).

Var. (?) *subintegra*. Scarcely viscid. Leaves long, entire or slightly toothed.—W. Australia, Drummond, n. 204 and 205. These specimens are in flower only, and resemble narrow-leaved forms of *D. truncatiales*. The species is very near to *D. viscosa angustifolia*, but with narrower leaves and the angular branches of *D. truncatiales*, and differs from both in the leaves usually toothed.

SERIES II. PLATYPTERÆ.—Leaves quite entire, flat. Wings of the capsule very divergent or divaricate, not reaching to the style nor to the base, each carpel including its wing, broader than long, transversely ovate or oblong.

13. **D. truncatiales**, *F. Mueller*. Fragm. ii. 143, and *Pl. Vict.* i. 226. A tall glabrous shrub, scarcely viscid, the younger branches acutely angular. Leaves narrow-lanceolate or linear, rather acute, 2 to 4 or even 5 in. long, narrowed into a short petiole, entire or obscurely sinuate-toothed, the lateral veins little conspicuous. Racemes and flowers of *D. viscosa*. Sepals ovate, usually broad and nearly as long as the anthers. Capsule 4- or rarely 3-

lobed, flat at the top, the wings oblong, very diverging, not extending to the base of the carpels. Dissepiments remaining attached to the axis as in all the preceding species, or occasionally deciduous, but not splitting as in the two following species.—*D. calycina*, A. Cunn. Herb.; A. Gray, Bot. Amer. Expl. Exped. i. 262.

N. S. Wales. Port Jackson, *R. Brown*; frequent in the Blue Mountains, Croker's Range, and to the southward, *Fraser*, *A. Cunningham*, and others; Towamba and Yowaka rivers, *F. Mueller*.

Victoria. Wooded banks of Genoa river, *F. Mueller*.

14. ***D. platyptera*, *F. Muell. Fragm.* i. 73.** A tall shrub with the habit of the larger forms of *D. viscosa*, glabrous and viscid. Leaves elliptical-oblong or broadly lanceolate, rather obtuse, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, entire, almost coriaceous, the pinnate veins rather numerous, but very fine, narrowed into a short petiole. Petals few, slender, in short racemes. Sepals narrow-ovate. Capsule flat at the top, the wings very diverging, obovate-oblong, not reaching to the style nor to the base of the carpels; dissepiments splitting and falling off with the valves, leaving only the filiform axis persistent.

N. Australia. Cygnet Bay, N.W. coast, *A. Cunningham*; Fitzmaurice river, *F. Mueller*. The specimens are not satisfactory. *F. Mueller's* have no flowers and only a few fruits; in *A. Cunningham's* the flowers are mostly fallen off, and I found amongst the capsules only one far enough advanced to identify them.

15. ***D. stenophylla*, *F. Muell. Fragm.* i. 72.** Glabrous and viscid. Leaves narrow-linear, rigid, 2 to 3 in. long, the margins usually thickened and entire. Flowers of *D. viscosa*, in short loose racemes or almost cymose panicles. Sepals ovate. Capsule small, the wings broadly oblong or obovate, diverging, not reaching to the style nor to the base of the carpels; dissepiments splitting and falling off with the valves, leaving only the filiform axis persistent.

Queensland. Broad Sound, *R. Brown*; Burdekin river, *F. Mueller*; Comet river, Leichhardt. In flower, this species is scarcely to be distinguished from *D. attenuata*, var. *linearis*; but the fruit is very different.

SERIES III. CORNUATE.—Leaves entire or toothed at the end, the margins revolute or rarely flat. Wings of the capsule reduced to erect or divergent, usually falcate, horn-like appendages at the upper outer angle of the carpels.

16. ***D. pinifolia*, *Miq. in Pl. Preiss.* i. 227.** A low shrub, with numerous divariccate or dichotomous branches, slender but rigid, terete or slightly angular, viscid when young. Leaves sessile, narrow-linear, obtuse or scarcely acute, in some specimens all under $\frac{1}{2}$ in., in others exceeding 1 in., the margins revolute, entire or with a few teeth or short lobes when luxuriant. Flowers solitary or rarely 2 together, the males sessile, the females often shortly pedicellate. Sepals lanceolate. Anthers 6 to 8. Capsules 3 to 4 lines long, obtusely angled, the angles usually produced on the upper outer edge into short, erect, horn-like wings.—*Empleurosma virgata*, Baill. in *Pl. Preiss.* ii. 228.

W. Australia. Swan River, *Drummond*, n. 117; York district, *Preiss*, n. 2166b, and 2438; Gordon river and Murchison river, *Oldfield*.

Var. *subulata*. Branches more angular; capsules apparently almost without horns, but not perfect in our specimens, *Drummond*, 4th Coll. n. 255.

17. **D. ceratocarpa**, *Eadl. in Haeg. Enum.* 13. An erect or divaricate rigid shrub, the smaller branches virgate, acutely angled or almost winged, glabrous and often viscid. Leaves narrow-ovate oblong or narrow-cuneate, obtuse or acute, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, entire or when luxuriant sometimes 2- or 3-toothed, narrowed into a very short petiole, rather coriaceous, a few lateral veins sometimes conspicuous underneath, the margins usually recurved. Flowers on very short pedicels, few together in very short terminal leafy racemes or axillary clusters. Sepals broad, thin and almost petal-like, above 1 line long, the buds very angular. Style occasionally elongated. Capsule 2 to 3 lines long, glabrous, 4-angled, the angles produced at the upper outer edge into erect horn-like lanceolate or falcate wings, 1 to 2 lines long.—*D. pterocaulis*, Miq. in *Pl. Preiss.* i. 225.

W. Australia. Bald Head and Goose Island Bay, *R. Brown*; King George's Sound and towards Cape Riche, *A. Cunningham*, *Drummond*, n. 102, and 5th Coll. n. 246, 247, *Preiss*, n. 2440, and others.

18. **D. divaricata**, *Benth.* A low shrub, with divaricate branches, the smaller ones slender but rigid and sometimes almost spinescent, terete, glabrous or minutely pubescent and viscid. Leaves linear or linear-cuneate, 2 to 4 lines or rarely $\frac{1}{2}$ in. long, entire or 3-lobed, rigid, with revolute margins. Flowers not seen. Capsules sessile or nearly so, obtusely 3- or 4-angled, often hirsute on the back, the outer angles produced into long lanceolate or falcate horn-like wings.

W. Australia. Between Moore and Murchison rivers, *Drummond*, n. 96, and 4th Coll. n. 256.

SERIES IV. APTERÆ.—Leaves entire or toothed. Capsules without wings, or the angles slightly and irregularly dilated into very narrow wings. Dissepiments persistent on the axis, except in *D. bursarifolia*.

19. **D. triangularis**, *Lindl. in Mitch. Trop. Austr.* 219 (male plant). An erect shrub of 3 to 4 ft., glabrous, pubescent or softly villous. Leaves obovate cuneate or almost triangular, rounded truncate or 3-toothed at the end, or very rarely elliptical-oblong, $\frac{1}{2}$ to 1 in. or rarely $1\frac{1}{2}$ in. long, coriaceous, 1-nerved, the lateral veins quite inconspicuous. Flowers axillary, solitary or clustered, on short pedicels. Sepals narrow-lanceolate, rather thick. Anthers as in *D. triquetra*, narrow, acuminate, exceeding the calyx. Capsule glabrous or pubescent, 3- or 4-angled, the angles rarely dilated towards the top into very narrow wings; dissepiments remaining attached to the axis, or very rarely deciduous but not splitting.—*D. mollis*, *Lindl.* in *Mitch. Trop. Austr.* 212 (with pubescent capsules); *D. trigona*, *Lindl.* l. c. 236 (with glabrous capsules); *D. Lindleyana*, *F. Muell.* *Pl. Vict.* i. 88.

Queensland. Suttor river, *F. Mueller*; near Mount Owen, Mount Faraday, and Mantuan Downs, *Mitchell*; near Brisbane and Ironbark forest, *Leichhardt*.

N. S. Wales. W. branches of Hunter's River, *A. Cunningham*.

20. **D. aptera**, *Miq. in Pl. Preiss.* i. 225. A shrub of 2 to 5 ft., glabrous and slightly viscid, the young branches very prominently angled. Leaves obovate, very obtuse or obocordate, mostly 1 to $1\frac{1}{2}$ or even 2 in. long, entire, narrowed into a petiole, coriaceous, 1-nerved, the lateral veins inconspicuous. Racemes terminal, short, few-flowered. Sepals broadly lanceolate,

1 to $1\frac{1}{2}$ lines long, rather thick. Anthers narrow-oblong. Style often elongated. Capsule slightly 3- or 4-angled, not winged, glabrous, 3 or 4 lines long, the persistent dissepiments broad. Seeds ovoid, smooth, and rather shining.—*D. sororia*, Miq. in *Pl. Preiss.* i. 225.

W. Australia. Swan River and Rottnest Island, *Preiss*, n. 2385 and 2439, *Drummond*, *Coll.* 1841, n. 231 and 232, and others; Bonache Island, *Fraser*. I can perceive no difference between the two forms described by Miquel. The fruit-pedicels vary from 3 to 8 lines.

21. **D. bursarifolia**, Behr and F. Muell. in *Trans. Vict. Inst.* i. 8. A glabrous much-branched shrub, scarcely viscid, the smaller branches slender, terete or scarcely angled. Leaves from obovate to oblong-cuneate or oblong, usually obtuse, under $\frac{1}{2}$ in. or rarely $\frac{2}{3}$ in. long, entire, coriaceous, the lateral veins inconspicuous. Pedicels short, solitary or 2 or 3 together, axillary or terminal. Sepals narrow-lanceolate. Anthers oblong, usually exceeding the calyx. Styles often elongated. Capsule 4 to 5 lines long, 3- or 4-angled, either not winged or with very narrow wings; dissepiments splitting and falling off with the valves, leaving only the filiform axis persistent.—F. Muell. *Pl. Vict.* i. 87, t. 5.

Victoria. Murray desert, F. Mueller.

S. Australia. Pine Forest, near Salt Creek, Behr; barren ridges and dry scrubby plains, near St. Vincent's Gulf, F. Mueller.

W. Australia. In the interior, *Drummond*, n. 14 and 187.

Var. (?) *major*. Leaves rather longer and not so broad in proportion, very rarely coarsely toothed. Fruit not seen, and therefore the species doubtful.—Sharks Bay and Dirk Hartog's Island, Milne.

22. **D. Baueri**, Endl. in *Hueg. Enum.* 13. A small or spreading shrub, with short slender but rigid branches, glabrous and more or less viscid. Leaves broadly ovate, obovate or almost orbicular, obtuse or truncate, usually slightly sinuate-toothed, mostly 4 to 6 lines long, coriaceous, 1-nerved, the lateral veins inconspicuous. Pedicels short, recurved, axillary and solitary or few in a short terminal raceme. Sepals broadly ovate, rather thick. Capsule small, 3- or 4-angled, the angles very rarely produced into very narrow wings at the upper outer edge.—*D. deflexa*, F. Muell. in *Trans. Vict. Inst.* i. 8, and *Pl. Vict.* i. 87.

Victoria. In the Murray scrub, F. Mueller.

S. Australia. S. coast, R. Brown; Flinders Range and Spencer's Gulf, F. Mueller; Venus Bay, Warburton.

23. **D. humifusa**, Miq. in *Pl. Preiss.* i. 226. A low, diffuse or prostrate, much-branched shrub, often rooting at the nodes, glabrous or the young branches slightly pubescent and scarcely viscid. Leaves crowded, linear-cuneate, oblong-spathulate or rarely almost triangular, obtuse or rarely acute, mostly under $\frac{1}{2}$ in. and rarely $\frac{2}{3}$ in. long, entire or deeply 3-toothed, coriaceous, 1-nerved, the lateral veins rarely conspicuous. Flowers usually 2 or 3 together on rather long pedicels. Sepals ovate or ovate-lanceolate, often 2 lines long in the males, smaller in the females. Style often elongated. Capsule about 3 lines long, 3- or 4-angled, the angles acute or expanded towards the top into very narrow wings.

W. Australia. Clayey and gravelly plains, Hay district, *Preiss*, n. 2441; towards Cape Riche, *Drummond*, 5th *Coll.* n. 250 and 251; Tone river and Tulbrunup lake, *Old-*



field. The general aspect is that of *D. procumbens*, from which it is readily known by the large sepals or by the fruit.

Var. *hirtella*. Branches hirsute with short spreading hairs. Leaves mostly 3-lobed.—Drummond, 5th Coll. n. 249.

24. **D. hexandra**, F. Muell. in *Trans. Vict. Inst.* 1855, 117. A low shrub, closely resembling *D. pinifolia* in habit, foliage, and flowers. Leaves narrow-linear with revolute margins, almost terete or subulate, under 1 in. long. Flowers solitary or 2 together, on very short recurved pedicels. Sepals ovate or lanceolate. Anthers usually 6. Capsule nearly globular or obscurely 4-angled, about 2 or nearly 3 lines diameter, not horned, but sometimes bearing small tubercles at the upper outer edge of the angles.

S. Australia. S. coast, R. Brown; Port Lincoln, Mount Greenly, and Marble Range, Wilhelm.

25. **D. ericoides**, Miq. in *Pl. Preiss.* i. 227. A low shrub, with a thick rootstock and erect rather slender branching stems, often under 1 f. high but sometimes twice as much, glabrous as well as the leaves or hoary-pubescent. Leaves sessile, linear, obtuse, 2 to 3 lines or rarely $\frac{1}{2}$ in. long, the margins closely revolute, entire or with 2 or 3 small teeth or lobes. Flowers terminal, solitary, on very short recurved leafy peduncles. Sepals broadly lanceolate, acuminate, often 2 lines long, more or less hoary-tomentose. Capsule hoary-pubescent, nearly globular, with obtuse angles, neither winged nor horned, 3- or 4- rarely 5-celled.

W. Australia. In the interior, rare, *Preiss.* n. 2435: *Drummond*, Coll. 1843, n. 726.

SERIES V. PINNATÆ.—Leaves all pinnate or very rarely a few simple ones at the base of the branches. Capsule of the *Cyclopædæ*, except in *D. oxyptera* and *D. inæquifolia*, where it approaches that of the *Platypædæ*, and in *D. humilis*, where it is apterous; dissepiments persistent on the axis in all except *D. inæquifolia*.

26. **D. polyzyga**, F. Muell. *Fragn.* i. 74. A tall shrub, the short flowering branches nearly terete and, as well as the leaves, sparingly pubescent and glandular-viscid. Leaves pinnate, the rachis slightly dilated or nearly terete; leaflets numerous, often above 30, oblong, acute, rarely exceeding $\frac{1}{2}$ in., entire, obliquely rounded at the base and almost petiolulate, flat, 1-nerved, rather rigid but not coriaceous. Flowers not seen. Fruiting racemes terminal, loose, but much shorter than the leaves; pedicels recurved, $\frac{1}{2}$ in. long. Sepals lanceolate, foliaceous, 3 to 4 lines long. Capsule like the larger ones of *D. viscosa*, the wings rather broad but variable in shape, the terminal sinus usually open.

N. Australia. Upper Victoria river, F. Mueller.

27. **D. megazyga**, F. Muell. *Herb.* A tall shrub, glabrous and slightly viscid, the young branches acutely angled. Leaves mostly pinnate, the rachis conspicuously winged; leaflets usually numerous, sometimes above 30, lanceolate, acute, $\frac{1}{2}$ to 1 in. long; in some specimens the lower leaves of the branches reduced to very few leaflets or to a simple linear-lanceolate leaf. Flowers rather large, in short axillary racemes or terminal panicles, the pedicels slender. Sepals ovate. Capsules small, with broad obovate or orbicular diverging wings of 3 or 4 lines.

N. S. Wales. Hastings river, *Herb. Lindley, Beckler*; Dogwood Creek, *Leichhardt*; Paramatta, *Woolls*. F. Mueller, Pl. Vict. i. 86, refers this to *D. viscosa*, on the ground of a few simple leaves occurring on Leichhardt's and Woolls's specimens; but even then the foliage and angular stems appear to me to be much more those of *D. truncatiales*, and the shape of the fruit rather different from both. Woolls's Paramatta specimens have no fully-formed fruits. The simple leaves are rare, and appear to occur only at the base of the branches.

28. ***D. physocarpa*, F. Muell. *Fragm.* i. 74.** A tall shrub, the flowering branches short, nearly terete, and as well as the leaves slightly pubescent as in *D. polyzyga*, but much less viscid. Leaves pinnate, the rhachis angular but scarcely dilated; leaflets rarely more than 10 and often only 4 to 6, obovate or oblong, obtuse or mucronate, mostly 3 to 4 lines long, entire or rarely obscurely 2- or 3-toothed, flat, 1-nerved, sometimes rather thick but not coriaceous. Racemes terminal, short, loosely few-flowered. Sepals lanceolate, obtuse, nearly 2 lines long. Anthers short, obtuse. Style often elongated. Capsule large, somewhat inflated, often 5- or 6-celled, the axis above $\frac{1}{2}$ in. long; wings not very broad, rounded above and below, but much injured in our specimens. Seeds opaque.

N. Australia. Sea range, Victoria river, *F. Mueller*.

29. ***D. vestita*, Hook. in Mitch. *Trop. Austr.* 265.** A much-branched shrub, densely villous, hirsute or pubescent, the hairs sometimes long and almost golden. Leaves pinnate, the rhachis winged; leaflets varying from few broadly obovate-cuneate and 2 or 3 lines long, to above 20, narrow-oblong and 4 or 5 lines long, entire or rarely 2- or 3-toothed, the margins always much recurved. Pedicels usually in clusters of 3 or 4, about $\frac{1}{2}$ in. long. Sepals lanceolate, acute, attaining 3 lines. Anthers 8 to 10, linear, hirsute, spirally twisted as they fade. Capsule when young hirsute with long hairs, the wings broadly orbicular, when far advanced the hairs mostly disappear and the wings are much narrower in proportion to the carpels. — *D. paulliniæfolia*, A. Cunn. *Herb.*; Steud. *Nom. Bot.* ed. 2.

Queensland. Belyando river, *Mitchell* (very hirsute specimens, with few, small, broad leaflets, and broadly winged, very hirsute, young fruits); Endeavour river, *Banks*; *A. Cunningham* (scarcely more than pubescent, with numerous narrow leaflets and narrow-winged, scarcely hirsute, old fruits); Castle Creek and head of Boyd river, *Leichhardt* (leaves and indumentum intermediate, and on one specimen the young fruit, like Mitchell's, on one branch, and an old capsule, like Cunningham's, on another branch).

30. ***D. pinnata*, Sm. in Rees, *Cycl.* xii.** Branches terete, softly hirsute as well as the leaves as in *D. vestita*. Leaves pinnate, the rhachis winged; leaflets from about 8 to above 30, from obovate to oblong-obtuse, 2 to 4 lines long, the margins recurved, hirsute on both sides and hoary-tomentose underneath, the upper leaves often much reduced. Male flowers in short terminal compact racemes exceeding the leaves; pedicels short. Sepals broadly lanceolate, rather more than 1 line long. Anthers obtuse, hirsute, about as long as the calyx. Female flowers and fruit not seen.

N. S. Wales. Port Jackson, *R. Brown (Hb. R. Br. and Smith)*. Intermediate in foliage between *D. vestita* and *D. multiflora*. This differs from both in inflorescence, but its affinities must remain doubtful until the fruit has been seen.

31. ***D. oxyptera*, F. Muell. *Fragm.* i. 74.** A shrub of several ft., the

branches virgate, terete, pubescent as well as the leaves and more or less viscid. Leaves pinnate, the rhachis angular but scarcely dilated; leaflets usually 5 to 11, narrow-oblong or oblong-cuneate, obtuse, 2 to 4 lines or rarely $\frac{1}{2}$ in. long, the margins recurved. Flowers small, sessile or very shortly pedicellate. Sepals broad, acute, about 1 line long. Anthers obtuse, not exceeding the calyx, often hirsute. Capsule small, slightly hairy, the axis 2 to 3 lines long, the wings rigid, divergent, almost triangular and acute.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; dry rocky hills, Fitz-maurice river, Arnhem's Land, *F. Mueller*. Several of *R. Brown*'s specimens have numerous male flowers and fruits on the same individual.

32. **D. humilis**, *Endl. Nov. Stirp. Dec.* 26, and *Monat.* t. 31. A much-branched glabrous shrub, often viscid. Leaves pinnate, the rhachis slightly dilated; leaflets 5 to 13 or rarely more, broadly obovate-cuneate, deeply toothed at the end, 2 to 4 lines or rarely $\frac{1}{2}$ in. long, narrowed at the base, the margins slightly recurved, 1-nerved, rather rigid. Flowers in short, dense, terminal corymbs, on very short pedicels. Sepals ovate or oblong, about 1½ lines long, often glandular-ciliate. Filaments more conspicuous than in most species; anthers slightly exceeding the calyx, tipped by a stipitate gland, spirally twisted as they fade. Capsule nearly globular, about 4 lines diameter, not winged, beset with rigid glandular-tipped bristles, otherwise glabrous.

S. Australia. Memory Cove, *R. Brown*; Port Lincoln, *Wilhelmi*; Spencer's Gulf and Streaky Bay, *Warburton*.

33. **D. boroniæfolia**, *G. Don, Gen. Syst.* i. 674. A much-branched shrub, usually pubescent or shortly hirsute, rarely glabrous, often viscid. Leaves pinnate, the rhachis more or less dilated; leaflets 5 to 9 or rarely more, obovate or cuneate-oblong, obtuse or truncate, and usually toothed at the end, 2 to 3 lines long or rarely more, coriaceous, with recurved margins. Pedicels clustered on very short lateral branches, those of the males very short, of the females often 3 to 4 lines long. Sepals ovate-lanceolate, about 1 line long. Anthers short, obtuse. Capsule of *D. viscosa*, glabrous, usually rather small, the wings not very broad, rounded at the top and at the base.—*D. Caleyana*, *G. Don, Gen. Syst.* i. 674 (from the character given); *D. hirtella*, *Miq. in Linnæa*, xviii. 94; *F. Muell. Pl. Vict.* i. 89.

Queensland. On the Maranoa, *Mitchell*; Kent's Lagoon and Bokhara flats, *Leichhardt*.

N. S. Wales. Liverpool plains, near Bathurst, Lachlan river, etc., *A. Cunningham*; Gwydir river, *Leichhardt*; between the Darling and Cooper's Creek, *Neilson*.

Victoria. Granite rocks between the Goulburn and Ovens rivers, *F. Mueller*. Several of these specimens have larger, more toothed leaflets, conspicuously marked with black dots.

34. **D. multijuga**, *G. Don, Gen. Syst.* i. 674. Shrubby and not so compact as the preceding species, pubescent or nearly glabrous, and very viscid. Leaves pinnate, the rhachis slightly dilated; leaflets usually from 15 to above 30, obliquely obovate or oblong, obtuse, often toothed, 3 to 4 lines long, the margins recurved. Flowers on slender pedicels in loose racemes, mostly terminal. Sepals lanceolate, acute, 1½ to 2 lines long. Anthers linear-oblong, nearly as long as the sepals. Capsule of *D. viscosa*, but usually larger than in *D. boroniæfolia*.

N. S. Wales. Port Jackson, *R. Brown*; Blue Mountains, *Miss Atkinson*; Illawarra,

A. Cunningham, Shepherd. Besides the numerous leaflets, this appears to be sufficiently distinct from *D. boroniaefolia*, in the longer sepals and anthers, and in inflorescence.

35. **D. larræoides**, Turcz. in *Bull. Mosc.* 1858, i. 408. Shrubby, glabrous, and very viscid, the young branches slightly angular. Leaves pinnate, the rhachis scarcely dilated; leaflets usually from 15 to near 30, linear-oblong, 2 to 4 lines long, or occasionally shorter and broader, entire or rarely minutely toothed, keeled underneath, rather rigid, the margins not recurved. Flowers not seen. Fruiting pedicels slender, clustered or very shortly racemose. Capsule of *D. viscosa*, not very large, the wings rounded at the top and at the base.—*D. multiæqua*, F. Muell. *Fragm.* i. 219, not of G. Don; and therefore altered to *D. foliolosa*, F. Muell. *Fragm.* ii. 182.

W. Australia, Drummond, 3rd Coll., n. 213; stony places, Geraldine mines, Murchison river, Oldfield.

36. **D. inæquifolia**, Turcz. in *Bull. Mosc.* 1858, i. 408. Shrubby, rigid, glabrous and usually very viscid. Leaves pinnate, the rhachis scarcely dilated; leaflets usually above 15, from linear-terete and 2 to 4 lines, to oblong and scarcely 1 line long, obtuse and often callous at the end, channeled above, convex underneath. Pedicels rather slender, clustered, those of the males very short. Sepals ovate, 1 to 1½ lines long. Anthers short and very obtuse. Capsules small, the wings usually ovate or obovate and very divergent, narrowed at the top and the base almost as in the *Platypera*. Seeds smooth and shining.—*D. leptozygia*, F. Muell. *Fragm.* i. 219.

W. Australia, Drummond, 4th Coll., n. 258; Sharks Bay, Deaham; Dirk Hartog's Island, Milne; Murchison river, Oldfield.

37. **D. adenophora**, Miq. in *Linnæa*, xviii. 95. A rigid shrub, glabrous and usually very viscid, the young branches angular. Leaves pinnate, the rhachis scarcely dilated; leaflets 3 to 9 or rarely 11, linear or slightly cuneate, obtuse and often callous at the tips, 2 to 4 lines long, very rarely slightly toothed at the end, convex or keeled underneath, flat above, rather thick and rigid. Pedicels slender, clustered. Sepals ovate, acute, or very shortly racemose, rather more than 1 line long. Anthers short, very obtuse. Capsule small, the wings rather broad, rounded at the top and at the base; dissepiments splitting and coming off with the valves, leaving only the filiform axis persistent as in *D. platypera*, *D. stenophylla*, and *D. bursarifolia*.—*Thouinia (?) adenophora*, Miq. in *Pl. Preiss.* i. 224.—*D. tenuifolia*, Lindl. in Mitch. *Trop. Austr.* 248 (the Queensland and N. S. Wales specimens).

Queensland. Condamine river, Leichhardt; Belyando river, Mitchell.

N. S. Wales. Rocky hills near Liverpool plains, A. Cunningham.

W. Australia, Drummond, 5th Coll., *Suppl.*, n. 38; Darling range, Preiss, n. 2442.

Leichhardt's specimens are in leaf only, and Mitchell's in flower only. Cunningham's are in flower and fruit, but the capsules are not quite ripe enough to be certain of the dehiscence; as far as they go, however, I can see no difference whatever between them and Drummond's excellent fruiting specimens, which again agree perfectly with the fruiting fragments I have seen of Preiss's. Should, however, the eastern plant prove to have the persistent dissepiments of *D. viscosa*, it will stand as a distinct species, under the name of *D. tenuifolia*, Lindl., differing from *D. stenozyga* in its flat, linear leaflets, and clustered or racemose pedicels.

38. **D. stenozyga**, F. Muell. *Fragm.* i. 95, and *Pl. Vict.* i. 88. An

erect, compact, very much branched shrub, glabrous and often viscid, the last slender branchlets not much thicker than the petioles and leaflets. Leaves mostly pinnate with few usually distant linear and almost terete leaflets rarely above $\frac{1}{2}$ in. long, channelled above and convex underneath like the common petioles. Male flowers not seen. Female pedicels solitary, 2 to 6 lines long. Sepals oblong-lanceolate, about 1 line long. Capsules of *D. viscosa*, rather large, the wings rounded at the top and at the base, the terminal sinus open; persistent dissepiments rather broad.

N. S. Wales. Desert of the Darling, *Dallachy* and *Goodwin*.

Victoria. Desert near the confluence of the Loddon and the Murray, *F. Mueller*.

S. Australia. S. coast, *R. Brown* (leaflets rather more numerous, but inflorescence of *D. stenozyga*).

W. Australia, *Drummond*, n. 188 (specimens precisely similar to the Victorian ones).

39? **D. concinna**, Benth. Very near *D. stenozyga*, and perhaps a variety, but the small specimens seen have a very different aspect. Leaflets 5 to 11, crowded on short coriaceous petioles, linear, almost terete, channelled above, convex underneath, 2 to 4 lines long. Flowers not seen. Fruiting pedicels several, in a very short raceme. Capsule of *D. viscosa*, the wings rounded at the top and at the base, the dissepiments broad and persistent in *D. stenozyga*, not splitting and deciduous as in the true *D. adenophora*. — *D. adenophora*, *F. Muell.* *Fragn.* i. 98, not of Miquel.

W. Australia. In the south-west, *Herb. F. Mueller*.

16. DISTICHOSTEMON, F. Muell.

Characters of *Dodonæa* except that the sepals vary from 5 to 8, and the stamens are indefinite, usually above 20, closely packed in 2 or more series.— Pubescent shrub. Leaves simple. Inflorescence more nearly an interrupted spike than in any *Dodonæas*.

The genus is limited to a single species, endemic in Australia, scarcely sufficiently distinct from *Dodonæa*.

1. **D. phyllopterus**, *F. Muell.* in *Hook. Kew Journ.* ix. 306. A tall shrub, softly tomentose-pubescent or villous in all its parts. Leaves very shortly petiolate, oblong or rarely obovate, very obtuse, 1 to 3 in. long, entire, soft and velvety on both sides, the veins prominent underneath. Flowers nearly sessile, in terminal leafless interrupted spikes or racemes of 1 to 3 in., rarely branching into oblong panicles. Sepals most frequently 6, but in some specimens almost all 5. Stamens although usually above 20, yet occasionally only 12 to 15, and often above 30; anthers oblong-linear, crowded, with very short filaments as in *Dodonæa*. Styles occasionally elongated as in some *Dodonæas*. Capsule more or less tomentose, obovoid-triquetrous, the angles more or less produced into herbaceous erect wings, usually ovate, very obtuse, and only on the upper outer half of the carpels, but occasionally, especially in the Banksian specimens, not so broad, and continued almost to the base. Seeds very shining, usually 2 in each cell.—*Dodonæa hispidula*, *Endl.* *Atakt.* t. 30.

N. Australia. N.W. coast, *Bynoe*; *Goulbourn Island* and *Cape Pond*, *A. Cunningham*; *Victoria river*, *Point Pearce*, and *Roper River*, *F. Mueller*; *Port Essington*, *Ar-*

strong.; islands of the Gulf of Carpentaria, *R. Brown*, *Henne*; from Arnhem's Land to the sources of Gilbert's River, not rare, *F. Mueller*.

Alectryon (?) *canescens*, DC. Prod. i. 617, from the E. coast, with oblong, obtuse, closely pubescent leaves, axillary racemes the length of the leaves, the fruit nearly of *Cameraria*, surrounded by a wing connate with the style, and thick, oblong seeds, is unknown to me. From the above very unsatisfactory description, it cannot be an *Alectryon*, and is most probably not *Sapindaceus*.

ORDER XXXIX. ANACARDIACEÆ.

Flowers unisexual polygamous or hermaphrodite, usually regular. Calyx of 3 to 5 lobes or distinct sepals. Petals 3 to 7, rarely none. Disk usually annular or broad. Stamens of the same number or twice as many as petals, very rarely indefinite, inserted round the disk or rarely upon it; filaments free; anthers versatile. Ovary superior, usually 1-celled, with 1 to 3 styles, or in the *Spondiaceae* 2- to 5-celled, or very rarely of 2 to 5 distinct carpels, or in male flowers reduced to 4 or 5 rudimentary style-like carpels. Ovules solitary in the ovary or in each of its cells, pendulous or broadly adnate to the side of the cavity, or suspended from a free funicle erect from the base of the cavity, with a dorsal raphe and inferior micropyle; very rarely in genera not Australian erect, with a ventral raphe and inferior micropyle. Fruit superior or rarely half inferior, free or adnate at the base to the enlarged calyx-tube or disk, 1-celled or (in *Spondiaceae*) several-celled, usually drupaceous and indehiscent. Seed erect horizontal or pendulous; albumen none or very thin. Embryo straight or incurved, cotyledons usually fleshy; radicle short, inferior or more frequently turned upwards or superior.—Trees or shrubs, the bark often exuding a caustic, balsamic or gummy juice. Leaves alternate or very rarely opposite, without real stipules, simple or ternately or pinnately compound, usually without glandular dots. Inflorescence various, usually paniculate, with small flowers. Flesh of the drupes usually oily or full of caustic juice.

The Order is abundantly distributed over the tropical regions of the New and the Old World, more rare in temperate climates. Of the five Australian genera, two are common to the New and the Old World, two are Asiatic, and the fifth is endemic.

Ovary 1-celled or carpels distinct.

Leaves pinnate or 3-foliolate.

Stamens 5 or 10. Ovule suspended from an erect funicle . . . 1. *Rhus*.

Stamens 10. Ovules suspended from the top of the cavity 3. EUROSCHINUS.

Leaves simple.

Stamens 10. Carpels 5 or 6. Ovules suspended from an erect funicle

2. BUCHANANIA.

Stamens 5. Ovary 1-celled. Ovule suspended from the top of the cavity 4. SEMECARPUS.

Ovary 2- or more celled. Leaves pinnate. Stamens 8 or 10. Ovules suspended from the top of the cavity

4. SEMECARPUS

1. RHUS, Linn.

Flowers polygamous. Calyx small, of 4 to 6, usually 5, imbricate sepals. Petals as many as sepals, imbricate in the bud. Disk broad, flat or annular.

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Stamens as many as petals or rarely 10, inserted round the base of the disk. Ovary 1-celled; styles 3, free or connate, with simple or capitate stigmas; ovule suspended from an erect filiform funicle. Drupe globular or compressed, usually small. Seed inverted or transverse, the radicle turned upwards. — Trees or shrubs. Leaves pinnate, 3-foliate, or in species not Australian simple. Flowers small, in terminal or axillary panicles.

The species are numerous in the warmer extra-tropical regions of both the northern and southern hemispheres, especially in S. Africa, more rare within the tropics. The Australian species are both endemic.

Leaves pinnate, glabrous. Flowers rather large. Stamens 10. Drupes globular 1. *R. rhodanthema*.
Leaves digitately 3- or 5-foliate, tomentose underneath. Flowers very small. Stamens 5 2. *R. viticifolia*.

1. ***R. rhodanthema*, F. Muell. Herb.** A tree of 70 to 80 ft., quite glabrous except little tufts of hairs along the midrib of the leaflets underneath. Leaves pinnate, the common petiole terete; leaflets usually 7 or 9, oblong, obtusely acuminate, mostly 2 to 2½ in. long, entire, shortly petiolulate, the pinnate veins prominent underneath. Panicles pyramidal or broadly thyrsoid, dense. Flowers dioecious, red, very shortly pedicellate, larger than in most species. Sepals broadly ovate, very obtuse, about 1 line long. Petals ovate, recurved, about 1½ lines. Stamens 10. Ovary broad; styles 3, short, thick, diverging, with capitate stigmas; ovule nearly globular, suspended as in the rest of the genus from an erect funicle. Drupe globular, shining, about ½ in. diameter, perianth thick and woody, striate outside, lined with a separable cartilaginous layer inside. Seeds orbicular, flat; testa membranous, but rather thick.

Queensland. Wide Bay, C. Moore; Brisbane river, Mortton Bay, Fraser, A. Cunningham, W. Hill, F. Mueller.

N. S. Wales. Clarence river, Herb. F. Mueller.

This species differs from the greater part of the genus in its large red flowers, 10 stamens, and larger globular drupes. *R. simarubifolia*, A. Gray, from the Fiji islands, approaches it in general habit and in the size of the flowers, but they are white and pentandrous, and the leaflets are firmer and more obtuse.

2? ***R. viticifolia*, F. Muell. Herb.** Branches, petioles, and inflorescence hoary-pubescent. Leaves digitately compound; Leaflets 3 or (according to F. Mueller) rarely 5, ovate or elliptical, acute, 2 to 3 in. long, entire or sinuate-toothed, narrowed into a petiolule, glabrous above, white or hoary underneath with a close tomentum. Flowers very small, in a pyramidal or thyrsoid terminal panicle. Sepals lanceolate, hirsute, about ½ line long. Petals oblong, nearly 1 line long, glabrous. Stamens 5. Female flowers and fruit not seen.

Queensland (?), Leichhardt. Evidently closely allied to the S. African *R. tomentosa*, Linn. The leaves appear to be less coriaceous, but otherwise the fragmentary specimens are insufficient to give diagnostic characters. Can it be the species imported?

2. **BUCHANANIA**, Roxb.

Flowers hermaphrodite. Calyx short, obtusely 3- to 5-toothed. Petals 5, imbricate in the bud. Disk orbicular, crenate. Stamens 10, inserted round

the disk. Gynoecium of 5 or 6 distinct carpels, of which one only perfect, the others rudimentary and style-like; style of the perfect one short, with a truncate stigma; ovule suspended from an erect filiform funicle. Drupe small, the putamen crustaceous or bony, 2-valved. Seed with thick cotyledons and a superior radicle.—Trees. Leaves alternate, simple, entire, coriaceous. Flowers small, white, in terminal or axillary panicles.

The genus extends over tropical Asia and the islands of the Pacific, the Australian species having also a wide Asiatic range.

1. **B. angustifolia**, Roxb. *Pl. Corom.* iii. 68, t. 262. A tree, either quite glabrous or the young shoots and panicles slightly rusty-tomentose or pubescent. Leaves oblong or cuneate-oblong, obtuse and rounded at the end, 3 to 8 in. long, and 1 to 2 in. broad, gradually narrowed into a short petiole, rather rigid, of a pale colour, the pinnate veins and transverse reticulate veinlets prominent on both sides. Panicles rather loose, shorter than the leaves, several together at the ends of the branches, each in the axil of a floral leaf usually reduced to a small bract; occasionally the central bud grows out and the panicles are placed at the base of the new branch. Flowers glabrous; petals nearly $1\frac{1}{2}$ lines long. Drupe more or less compressed, oblique, from broadly ovate to nearly oblong, rarely exceeding $\frac{1}{2}$ in. —W. and Arn. *Prod.* 169, with the synonyms adduced; Wight, *IC.* t. 101.

N. Australia. Victoria river, *Bynoe*, F. Mueller; Port Essington, *Armstrong*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Albany Island, F. Mueller; N.E. coast, *A. Cunningham*.

The species is widely distributed over East India and the Archipelago.

3. **EUROSCHINUS**, Hook. f.

Flowers polygamous or dioecious. Calyx small, 5-lobed. Petals 5, imbricate in the bud. Disk orbicular, deeply crenate. Stamens 10, inserted round the disk. Ovary 1-celled, with 3 thick short styles, or in the males of 3 or 4 linear style-like rudiments; ovule pendulous from the top of the cavity. Drupe small, more or less compressed, the putamen coriaceous. Seeds compressed, with flat cotyledons; the radicle turned upwards. Tree. Leaves pinnate. Flowers rather small, in terminal or lateral panicles.

The genus is limited to a single species, endemic in Australia. It is closely allied to the American genus *Schinus*, but with a rather different habit, a gamosepalous calyx, and the putamen of the fruit does not appear to contain the oily receptacles so conspicuous in that genus.

1. **E. falcatus**, Hook. *J. in Benth.* and Hook. *Gen. Pl.* 422. A low tree, glabrous or the young shoots minutely hoary. Leaflets 4 to 8, very oblique or falcate, ovate to lanceolate, shortly acuminate, 2 to 3 in. long, all but the terminal one very unequal at the base, on petioles of 1 to 3 lines, pinnerved and reticulate, the common petiole terete. Panicles divaricate, many-flowered, not exceeding the leaves. Flowers almost sessile, clustered along the branches, about 1 line long and glabrous. Calyx-lobes obtuse, slightly imbricate. Petals twice as long, oblong, very spreading. Drupe at first broadly and obliquely ovate, but in some specimens where they are better ripened more oblong, and attaining almost $\frac{1}{2}$ in. in length.

Queensland. Sources of the Burdekin, *F. Mueller*; Sunday Island, *McGillivray*.

N. S. Wales. Hastings river, *Beckler*; Clarence river, *C. Moore*.

Vri. angustifolius. Leaves falcate-lanceolate, much acuminate. Flowers rather larger.
—Northumberland Islands, *R. Brown*; Rockhampton, *Thozet*.

4. SEMECARPUS, Linn. f.

Flowers polygamous. Calyx small, 5-lobed. Petals 5, imbricate in the bud. Disk orbicular, slightly lobed or crenate. Stamens 5, inserted round the disk. Ovary 1-celled, with 3 styles, and somewhat club-shaped stigmas; ovule suspended from the top of the cavity. Drupe or nut reniform, seated on the much-enlarged, thick, succulent, fleshy, cupular or turbinate base of the calyx; pericarp thick, hard, filled with resinous cells. Seed pendulous, the testa coriaceous, somewhat fleshy inside; embryo thick, with plano-convex cotyledons and a very short superior radicle.—Trees. Leaves alternate, Flowers small, in terminal or lateral panicles.

The genus ranges over tropical Asia, the species most numerous in Ceylon; the Australian one extending over nearly the whole area.

1. **S. Anacardium**, Linn.; *W. and Arn.* Prod. 168, var. (?) *parvifolia*. Leaves broadly obovate, very obtuse, 3 to 4 in. long, entire, rounded at the base, on very short petioles, glabrous above, hoary or white underneath but scarcely tomentose, the pinnate veins and reticulate veinlets conspicuous on both sides. Male panicles pyramidal, shorter than or as long as the leaves. Flowers very small, sessile and clustered. Calyx very short. Petals scarcely 1 line long. Ovary minute and rudimentary or reduced to a tuft of hair. Female flowers and fruit of the Australian variety not seen.

N. Australia. Port Essington, *Armstrong*. The species is widely distributed over E. India, and has usually leaves from $\frac{1}{2}$ to 1 ft. long, but, as far as our specimens go, I can see no character, besides the smaller leaves, to distinguish the Australian form.

There is also in Armstrong's Port Essington collection, a single leaf, $2\frac{1}{2}$ ft. long by about 7 in. broad, and acutely acuminate, of what may be *S. cassumunar*, Roxb. Fl. Ind. II. 85, a Molucca species.

5. SPONDIAS, Linn.

(*Evia*, Comm.; *Cytherea*, *W. and Arn.*)

Flowers polygamous. Calyx small, 4- or 5-lobed or divided to the base. Petals 4 or 5, spreading, almost valvate in the bud. Disk orbicular, crenate. Stamens twice as many as petals, inserted round the disk. Ovary 3- to 5- (or sometimes 10- to 15-?) celled, with as many short, conical, connivent styles; ovules solitary in each cell, pendulous. Drupe with a fleshy epicarp, the putamen hard and bony, the cells erect or vertically curved and diverging at the top, the putamen pierced with a foramen corresponding to the apex of each cell. Seeds solitary in each cell, pendulous; testa membranous; embryo straight or slightly curved with the seed; cotyledons oblong, radicle superior.—Trees. Leaves crowded at the ends of the branches, pinnate. Flowers small, in terminal or axillary panicles.

The genus is widely spread over tropical countries, and some species are also cultivated under the name of *Hog Plums*. It is often divided into two: *Spondias*, chiefly American, with erect cells in the drupe, and *Evia* or *Cytherea*, chiefly Asiatic, with the cells divergent at the top. The Australian species, which is endemic, belongs to the latter group.

1. **S. Solandri**, *Benth.* A moderate-sized tree, the trunk occasionally acquiring a very great thickness, quite glabrous in all its parts. Leaflets 7 or 9, obliquely ovate or oblong, obtuse, 2 to 3 in. long, entire, very unequal at the base, pale underneath, with fine pinnate veins and reticulate veinlets. Flowers sessile, densely clustered, in short axillary interrupted spikes or racemes, rarely branching into panicles. Calyx-lobes separate almost to the base, ovate, obtuse, about $\frac{1}{2}$ line long. Petals 5, spreading, obtuse, about $1\frac{1}{2}$ lines long. Stamens 10, inserted in or under the crenatures of the disk; filaments slender; anthers small. Ovary half immersed in the disk, with 4 or sometimes 3 short conical styles.—*Spondias acida*, Soland. in *Herb. Banks*, not of Blume.

Queensland. Endeavour river, *Banks* and *Solander*; Keppel Bay, Shoalwater Bay, Broad Sound, and Northumberland Islands, *R. Brown*. The above description is taken from *R. Brown's* notes, and from two flowering specimens in the Banksian herbarium, and one in *R. Brown's*. There is also in the Banksian collection a packet of drupes named as belonging to this species and described as such in *R. Brown's* notes; but perhaps really those of some allied species, for they have from 10 to 15, usually about 12 cells, although in every other respect like those of the section *Eria* of *Spondias*. They are of a depressed globular form, the putamen with as many angles as cells, exceedingly hard, nearly 1 in. diameter; the cells diverging at the top as in other *Erias*.



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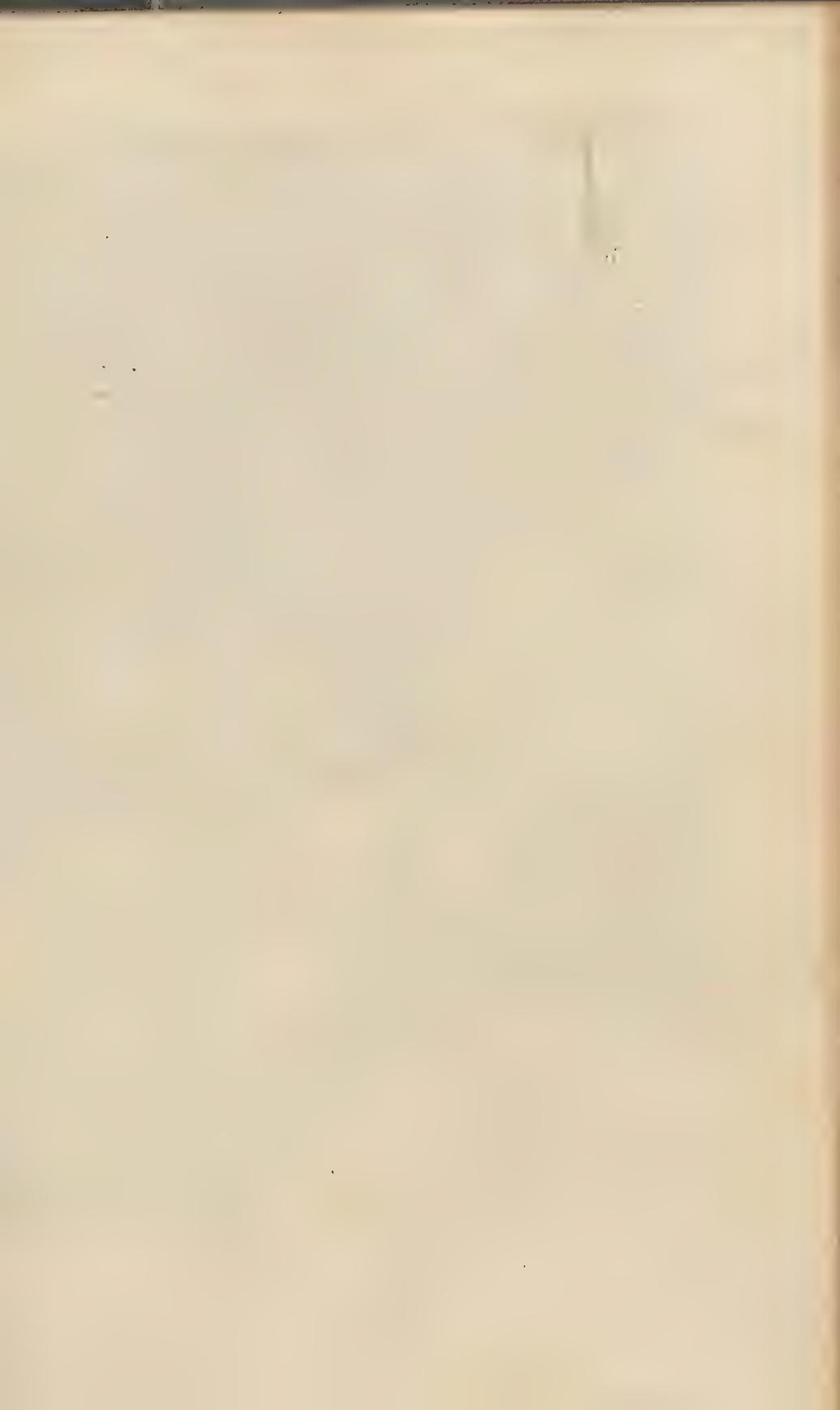
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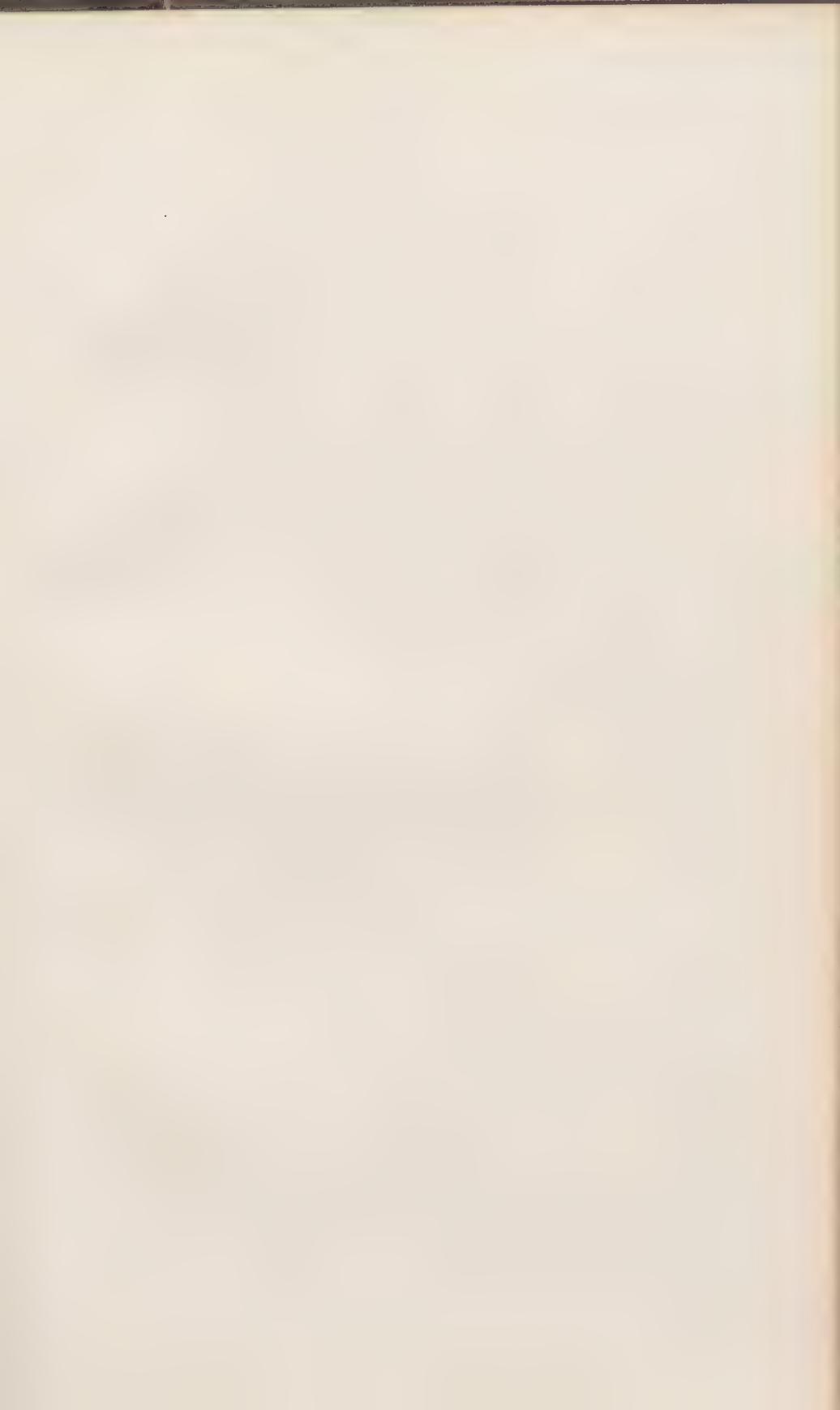
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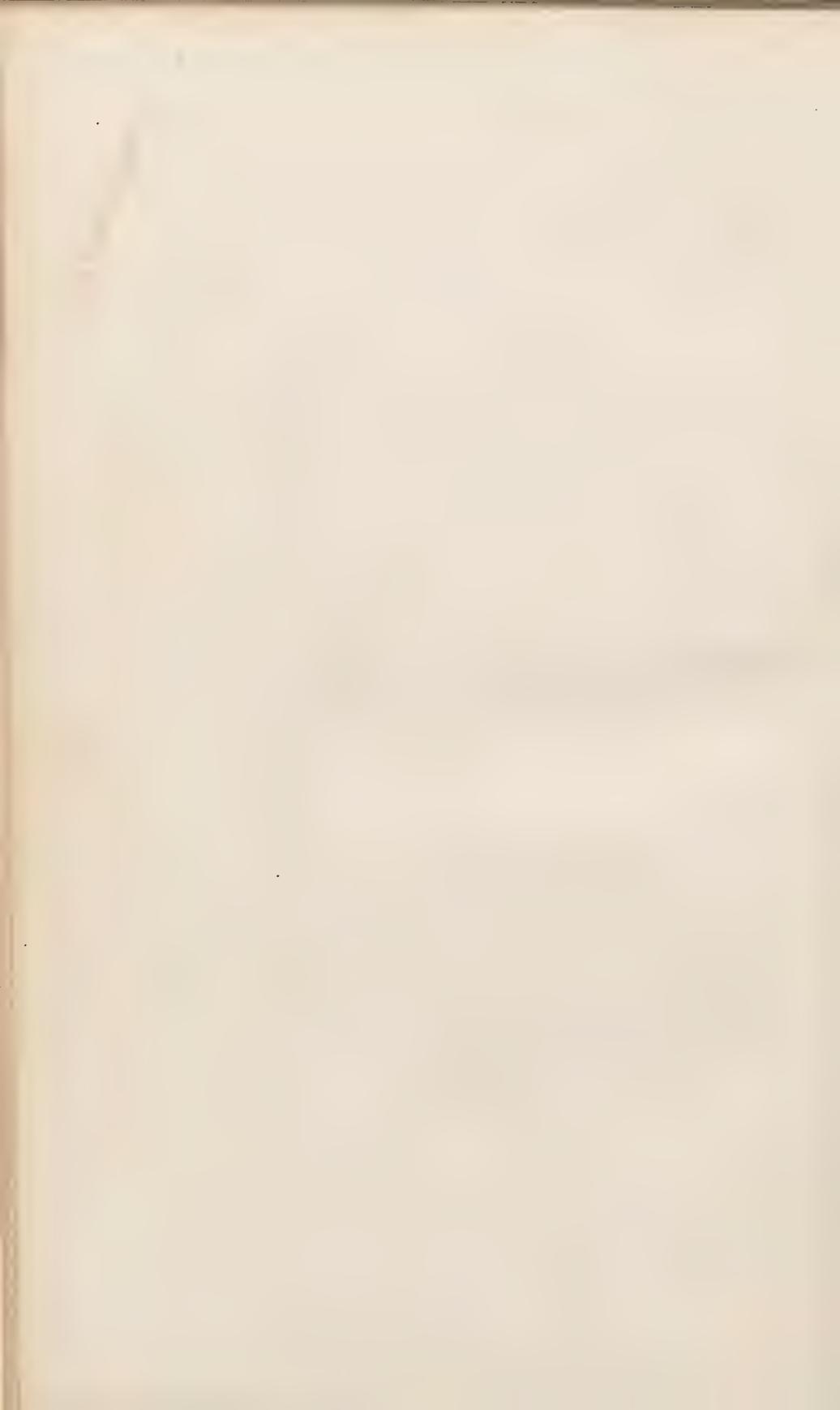
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Thlaspi glaucum (Tire.)
G. D. H.





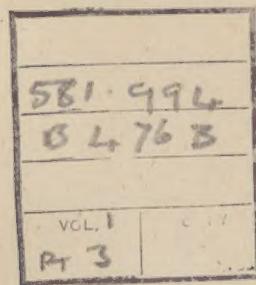


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